

HOW SECURITIES ARE TRADED

THIS CHAPTER WILL provide you with a broad introduction to the many venues and procedures available for trading securities in the United States and international markets. We will see that trading mechanisms range from direct negotiation among market participants to fully automated computer crossing of trade orders.

The first time a security trades is when it is issued to the public. Therefore, we begin with a look at how securities are first marketed to the public by investment bankers, the midwives of securities. We turn next to a broad survey of how already-issued securities may be traded among investors, focusing on the differences between dealer markets, electronic markets, and specialist markets. With this background, we then

turn to specific trading arenas such as the New York Stock Exchange, NASDAQ, and several foreign security markets, examining the competition among these markets for the patronage of security traders. We consider the costs of trading in these markets, the quality of trade execution, and the ongoing quest for cross-market integration of trading.

We then turn to the essentials of some specific types of transactions, such as buying on margin and short-selling stocks. We close the chapter with a look at some important aspects of the regulations governing security trading, including insider trading laws, circuit breakers, and the role of security markets as self-regulating organizations.

3.1 HOW FIRMS ISSUE SECURITIES

When firms need to raise capital they may choose to sell or *float* securities. These new issues of stocks, bonds, or other securities typically are marketed to the public by investment bankers in what is called the **primary market**. Trading of already-issued securities among investors occurs in the **secondary market**. Trading in secondary markets does not affect the outstanding amount of securities; ownership is simply transferred from one investor to another.

There are two types of primary market issues of common stock. **Initial public offerings**, or **IPOs**, are stocks issued by a formerly privately owned company that is going public, that is, selling stock to the public for the first time. *Seasoned* equity offerings are offered by companies that already have floated equity. For example, a sale by IBM of new shares of stock would constitute a seasoned new issue.

In the case of bonds, we also distinguish between two types of primary market issues, a *public offering* and a *private placement*. The former refers to an issue of bonds sold to the general investing public that can then be traded on the secondary market. The latter refers to an issue that usually is sold to one or a few institutional investors and is generally held to maturity.

Investment Banking

Public offerings of both stocks and bonds typically are marketed by investment bankers who in this role are called **underwriters**. More than one investment banker usually markets the securities. A lead firm forms an underwriting syndicate of other investment bankers to share the responsibility for the stock issue.

Investment bankers advise the firm regarding the terms on which it should attempt to sell the securities. A preliminary registration statement must be filed with the Securities and Exchange Commission (SEC), describing the issue and the prospects of the company. This preliminary prospectus is known as a *red herring* because it includes a statement printed in red, stating that the company is not attempting to sell the security before the registration is approved. When the statement is in final form, and accepted by the SEC, it is called the **prospectus**. At this point, the price at which the securities will be offered to the public is announced.

In a typical underwriting arrangement, the investment bankers purchase the securities from the issuing company and then resell them to the public. The issuing firm sells the securities to the underwriting syndicate for the public offering price less a spread that serves as compensation to the underwriters. This procedure is called a *firm commitment*. In addition to the spread, the investment banker also may receive shares of common stock or other securities of the firm. Figure 3.1 depicts the relationships among the firm issuing the security, the lead underwriter, the underwriting syndicate, and the public.

Shelf Registration

An important innovation in the issuing of securities was introduced in 1982 when the SEC approved Rule 415, which allows firms to register securities and gradually sell them to the public for 2 years following the initial registration. Because the securities are already registered, they can be sold on short notice, with little additional paperwork. Moreover, they can be sold in small amounts without incurring substantial flotation costs. The securities are “on the shelf,” ready to be issued, which has given rise to the term *shelf registration*.

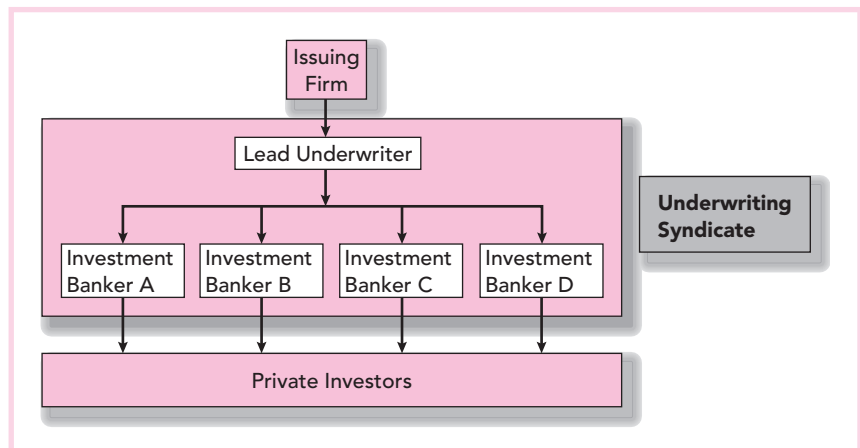


FIGURE 3.1 Relationship among a firm issuing securities, the underwriters, and the public

CONCEPT
CHECK

1

Why does it make sense for shelf registration to be limited in time?

Private Placements

Primary offerings also can be sold in a **private placement** rather than a public offering. In this case, the

firm (using an investment banker) sells shares directly to a small group of institutional or wealthy investors. Private placements can be far cheaper than public offerings. This is because Rule 144A of the SEC allows corporations to make these placements without preparing the extensive and costly registration statements required of a public offering. On the other hand, because private placements are not made available to the general public, they generally will be less suited for very large offerings. Moreover, private placements do not trade in secondary markets like stock exchanges. This greatly reduces their liquidity and presumably reduces the prices that investors will pay for the issue.

Initial Public Offerings

Investment bankers manage the issuance of new securities to the public. Once the SEC has commented on the registration statement and a preliminary prospectus has been distributed to interested investors, the investment bankers organize *road shows* in which they travel around the country to publicize the imminent offering. These road shows serve two purposes. First, they generate interest among potential investors and provide information about the offering. Second, they provide information to the issuing firm and its underwriters about the price at which they will be able to market the securities. Large investors communicate their interest in purchasing shares of the IPO to the underwriters; these indications of interest are called a *book* and the process of polling potential investors is called *bookbuilding*. These indications of interest provide valuable information to the issuing firm because institutional investors often will have useful insights about both the market demand for the security as well as the prospects of the firm and its competitors. It is common for investment bankers to revise both their initial estimates of the offering price of a security and the number of shares offered based on feedback from the investing community.

Why do investors truthfully reveal their interest in an offering to the investment banker? Might they be better off expressing little interest, in the hope that this will drive down the offering price? Truth is the better policy in this case because truth telling is rewarded. Shares of IPOs are allocated across investors in part based on the strength of each investor's expressed interest in the offering. If a firm wishes to get a large allocation when it is optimistic about the security, it needs to reveal its optimism. In turn, the underwriter needs to offer the security at a bargain price to these investors to induce them to participate in book-building and share their information. Thus, IPOs commonly are underpriced compared to the price at which they could be marketed. Such underpricing is reflected in price jumps that occur on the date when the shares are first traded in public security markets. The most dramatic case of underpricing occurred in December 1999 when shares in VA Linux were sold in an IPO at \$30 a share and closed on the first day of trading at \$239.25, a 698% 1-day return.¹

¹It is worth noting, however, that by December 2000, shares in VA Linux (now renamed VA Software) were selling for less than \$9 a share, and by 2002, for less than \$1. This example is extreme, but consistent with the generally disappointing long-term investment performance of IPOs.

While the explicit costs of an IPO tend to be around 7% of the funds raised, such underpricing should be viewed as another cost of the issue. For example, if VA Linux had sold its shares for the \$239 that investors obviously were willing to pay for them, its IPO would have raised 8 times as much as it actually did. The money “left on the table” in this case far exceeded the explicit cost of the stock issue. This degree of underpricing is far more dramatic than is common, but underpricing seems to be a universal phenomenon.

Figure 3.2 presents average first-day returns on IPOs of stocks across the world. The results consistently indicate that IPOs are marketed to investors at attractive prices. Underpricing of IPOs makes them appealing to all investors, yet institutional investors are allocated the bulk of a typical new issue. Some view this as unfair discrimination against small investors. However, our analysis suggests that the apparent discounts on IPOs may be in part payments for a valuable service, specifically, the information contributed by the institutional investors. The right to allocate shares in this way may contribute to efficiency by promoting the collection and dissemination of such information.²

Both views of IPO allocations probably contain some truth. IPO allocations to institutions do serve a valid economic purpose as an information-gathering tool. Nevertheless, the system can be—and has been—abused. Part of the Wall Street scandals of 2000–2002 centered on the allocation of shares in IPOs. In a practice known as “spinning,” some investment bankers used IPO allocations to corporate insiders to curry favors, in effect as implicit kickback schemes. These underwriters would award generous IPO allocations to executives of particular firms in return for the firm’s future investment banking business.

Pricing of IPOs is not trivial and not all IPOs turn out to be underpriced. Some do poorly after issue. The 2006 IPO of Vonage was a notable disappointment. The stock lost about 30% of its value in its first 7 days of trading. Other IPOs cannot even be fully sold to the market. Underwriters left with unmarketable securities are forced to sell them at a loss on the secondary market. Therefore, the investment banker bears price risk for an underwritten issue.

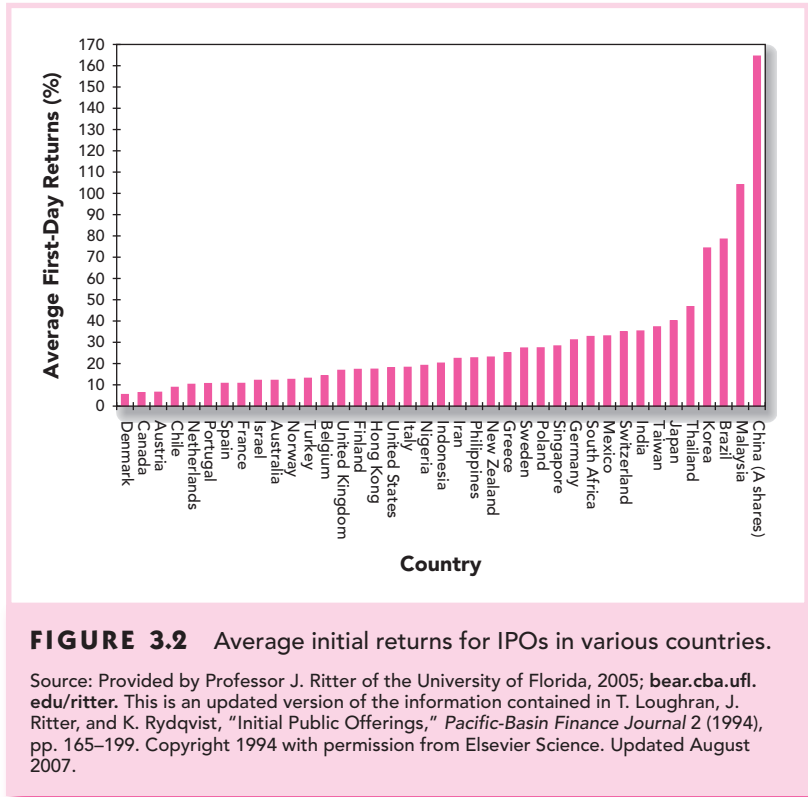


FIGURE 3.2 Average initial returns for IPOs in various countries.

Source: Provided by Professor J. Ritter of the University of Florida, 2005; bear.cba.ufl.edu/ritter. This is an updated version of the information contained in T. Loughran, J. Ritter, and K. Rydqvist, “Initial Public Offerings,” *Pacific-Basin Finance Journal* 2 (1994), pp. 165–199. Copyright 1994 with permission from Elsevier Science. Updated August 2007.

²An elaboration of this point and a more complete discussion of the bookbuilding process is provided in Lawrence Benveniste and William Wilhelm, “Going by the Book,” *Journal of Applied Corporate Finance* 9 (Spring 1997).

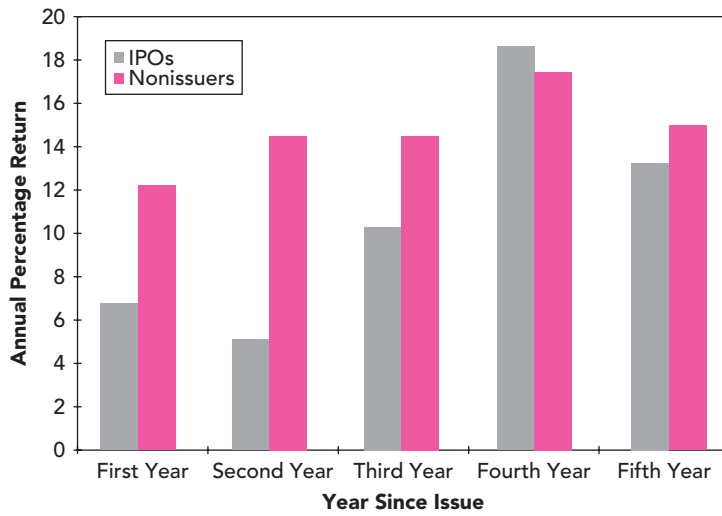


FIGURE 3.3 Long-term relative performance of initial public offerings

Source: Professor Jay R. Ritter, University of Florida, May 2005, bear.cba.ufl.edu/ritter/ipodata.htm.

Interestingly, despite their dramatic initial investment performance, IPOs have been poor long-term investments. Figure 3.3 compares the stock price performance of IPOs with shares of other firms of the same size for each of the 5 years after issue of the IPO. The year-by-year underperformance of the IPOs is dramatic, suggesting that, on average, the investing public may be too optimistic about the prospects of these firms. Such long-lived systematic errors on the part of investors would be surprising. An interesting study by Brav, Geczy, and Gompers,³ however, suggests that apparent IPO underperformance may be illusory. When they carefully match firms based on size and ratios of book values to market values, they find that IPO returns are actually similar to those of comparison firms.

3.2 HOW SECURITIES ARE TRADED

Financial markets develop to meet the needs of particular traders. Consider what would happen if organized markets did not exist. Any household wishing to invest in some type of financial asset would have to find others wishing to sell. Soon, venues where interested traders could meet would become popular. Eventually, financial markets would emerge from these meeting places. Thus, a pub in old London called Lloyd's launched the maritime insurance industry. A Manhattan curb on Wall Street became synonymous with the financial world.

Types of Markets

We can differentiate four types of markets: direct search markets, brokered markets, dealer markets, and auction markets.

Direct Search Markets A *direct search market* is the least organized market. Buyers and sellers must seek each other out directly. An example of a transaction in such a market is the sale of a used refrigerator where the seller advertises for buyers in a local newspaper. Such markets are characterized by sporadic participation and low-priced and nonstandard goods. It does not pay most people or firms to seek profits by specializing in such an environment.

³Alon Brav, Christopher Geczy, and Paul A. Gompers, "Is the Abnormal Return Following Equity Issuances Anomalous?" *Journal of Financial Economics* 56 (2000), pp. 209–49.

Brokered Markets The next level of organization is a *brokered market*. In markets where trading in a good is active, brokers find it profitable to offer search services to buyers and sellers. A good example is the real estate market, where economies of scale in searches for available homes and for prospective buyers make it worthwhile for participants to pay brokers to conduct the searches. Brokers in particular markets develop specialized knowledge on valuing assets traded in that market.

An important brokered investment market is the *primary market*, where new issues of securities are offered to the public. In the primary market, investment bankers who market a firm's securities to the public act as brokers; they seek investors to purchase securities directly from the issuing corporation.

Another brokered market is that for large block transactions, in which very large blocks of stock are bought or sold. These blocks are so large (technically more than 10,000 shares but usually much larger) that brokers or "block houses" often are engaged to search directly for other large traders, rather than bring the trade directly to the markets where relatively smaller investors trade.

Dealer Markets When trading activity in a particular type of asset increases, **dealer markets** arise. Dealers specialize in various assets, purchase these assets for their own accounts, and later sell them for a profit from their inventory. The spreads between dealers' buy (or "bid") prices and sell (or "ask") prices are a source of profit. Dealer markets save traders on search costs because market participants can easily look up the prices at which they can buy from or sell to dealers. A fair amount of market activity is required before dealing in a market is an attractive source of income. The over-the-counter (OTC) securities market is one example of a dealer market.

Auction Markets The most integrated market is an **auction market**, in which all traders converge at one place (either physically or "electronically") to buy or sell an asset. The New York Stock Exchange (NYSE) is an example of an auction market. An advantage of auction markets over dealer markets is that one need not search across dealers to find the best price for a good. If all participants converge, they can arrive at mutually agreeable prices and save the bid-ask spread.

Continuous auction markets (as opposed to periodic auctions, such as in the art world) require very heavy and frequent trading to cover the expense of maintaining the market. For this reason, the NYSE and other exchanges set up listing requirements, which limit the stocks traded on the exchange to those of firms in which sufficient trading interest is likely to exist.

The organized stock exchanges are also secondary markets. They are organized for investors to trade existing securities among themselves.

CONCEPT
CHECK
2

Many assets trade in more than one type of market. What types of markets do the following trade in?

- Used cars
- Paintings
- Rare coins

Types of Orders

Before comparing alternative trading practices and competing security markets, it is helpful to begin with an overview of the types of trades an investor might wish to have executed in these markets. Broadly speaking, there are two types of orders: market orders and orders contingent on price.

Market Orders Market orders are buy or sell orders that are to be executed immediately at current market prices. For example, our investor might call her broker and ask for the market price of IBM. The broker might report back that the best **bid price** is \$90 and the best **ask price** is \$90.05, meaning that the investor would need to pay \$90.05 to purchase a share, and could receive \$90 a share if she wished to sell some of her own holdings of IBM. The **bid–ask spread** in this case is \$.05. So an order to buy 100 shares “at market” would result in purchase at \$90.05, and an order to “sell at market” would be executed at \$90.

This simple scenario is subject to a few potential complications. First, the posted price quotes actually represent commitments to trade up to a specified number of shares. If the market order is for more than this number of shares, the order may be filled at multiple prices. For example, if the asked price is good for orders up to 1,000 shares, and the investor wishes to purchase 1,500 shares, it may be necessary to pay a slightly higher price for the last 500 shares. Second, another trader may beat our investor to the quote, meaning that her order would then be executed at a worse price. Finally, the best price quote may change before her order arrives, again causing execution at a price different from the one at the moment of the order.

Price-Contingent Orders Investors also may place orders specifying prices at which they are willing to buy or sell a security. A limit buy order may instruct the broker to buy some number of shares if and when IBM may be obtained *at or below* a stipulated price. Conversely, a limit sell instructs the broker to sell if and when the stock price rises *above* a specified limit. A collection of **limit orders** waiting to be executed is called a *limit order book*.

Figure 3.4 is a portion of the limit order book for shares in Intel taken from the Archipelago exchange (one of several electronic exchanges; more on these shortly) on one day in 2007. Notice that the best orders are at the top of the list: the offers to buy at the highest price and to sell at the lowest price. The buy and sell orders at the top of the list—\$20.77 and

\$20.78—are called the *inside quotes*; they are the highest buy and lowest sell orders. For Intel, the inside spread is only 1 cent. Note, however, that order sizes at the inside quotes are often fairly small. Therefore, investors interested in larger trades face an *effective* spread greater than the nominal one because they cannot execute their entire trades at the inside price quotes.

Until 2001, when U.S. markets adopted

INTC Intel Corp

NYSE Arca. INTC Go>>

| Bid | | | | Ask | | | |
|------|-------|-------|----------|------|-------|-------|----------|
| ID | Price | Size | Time | ID | Price | Size | Time |
| ARCA | 20.77 | 23100 | 14:08:23 | ARCA | 20.78 | 27200 | 14:08:23 |
| ARCA | 20.76 | 35725 | 14:08:22 | ARCA | 20.79 | 31800 | 14:08:23 |
| ARCA | 20.75 | 37391 | 14:08:21 | ARCA | 20.80 | 32000 | 14:08:22 |
| ARCA | 20.74 | 24275 | 14:08:23 | ARCA | 20.81 | 30500 | 14:08:22 |
| ARCA | 20.73 | 20524 | 14:08:23 | ARCA | 20.82 | 17090 | 14:08:21 |
| ARCA | 20.72 | 6890 | 14:08:21 | ARCA | 20.83 | 19650 | 14:08:01 |

FIGURE 3.4 The limit order book for Intel on the Archipelago market, January 19, 2007.

Source: New York Stock Exchange, www.nyse.com.

decimal pricing, the minimum possible spread was “one tick,” which on the New York Stock Exchange was $\frac{1}{8}$ until 1997 and $\frac{1}{16}$ thereafter. With decimal pricing, the spread can be far lower. The average quoted bid–ask spread on the NYSE is less than 5 cents.

Stop orders are similar to limit orders in that the trade is not to be executed unless the stock hits a price limit. For *stop-loss orders*, the stock is to be *sold* if its price falls *below* a stipulated level. As the name suggests, the order lets the stock be sold to stop further losses from accumulating. Similarly, *stop-buy orders* specify that a stock should be bought when its price rises above a limit. These trades often accompany *short sales* (sales of securities you don’t own but have borrowed from your broker) and are used to limit potential losses from the short position. Short sales are discussed in greater detail later in this chapter. Figure 3.5 organizes these types of trades in a convenient matrix.

| | | Condition | |
|--------|------|-----------------------|-----------------------|
| | | Price below the Limit | Price above the Limit |
| Action | Buy | Limit-Buy Order | Stop-Buy Order |
| | Sell | Stop-Loss Order | Limit-Sell Order |

FIGURE 3.5 Price-contingent orders

CONCEPT CHECK 3

What type of trading order might you give to your broker in each of the following circumstances?

- You want to buy shares of Intel to diversify your portfolio. You believe the share price is approximately at the “fair” value, and you want the trade done quickly and cheaply.
- You want to buy shares of Intel, but believe that the current stock price is too high given the firm’s prospects. If the shares could be obtained at a price 5% lower than the current value, you would like to purchase shares for your portfolio.
- You plan to purchase a condominium sometime in the next month or so and will sell your shares of Intel to provide the funds for your down payment. While you believe that the Intel share price is going to rise over the next few weeks, if you are wrong and the share price drops suddenly, you will not be able to afford the purchase. Therefore, you want to hold on to the shares for as long as possible, but still protect yourself against the risk of a big loss.

Trading Mechanisms

Broadly speaking, there are three trading systems employed in the United States: over-the-counter dealer markets, electronic communication networks, and formal exchanges. The best-known markets such as NASDAQ or the New York Stock Exchange actually use a variety of trading procedures, so before delving into specific markets, it is useful to understand the basic operation of each type of trading system.

Dealer Markets Roughly 35,000 securities trade on the **over-the-counter** or **OTC market**. Thousands of brokers register with the SEC as security dealers. Dealers quote prices at which they are willing to buy or sell securities. A broker then executes a trade by contacting a dealer listing an attractive quote.

Before 1971, all OTC quotations were recorded manually and published daily on so-called pink sheets. In 1971, the National Association of Securities Dealers Automatic Quotations System, or NASDAQ, was developed to link brokers and dealers in a computer network where price quotes could be displayed and revised. Dealers could use the network to display the bid price at which they were willing to purchase a security and the ask price

at which they were willing to sell. The difference in these prices, the bid–ask spread, was the source of the dealer’s profit. Brokers representing clients could examine quotes over the computer network, contact the dealer with the best quote, and execute a trade.

As originally organized, NASDAQ was more of a price-quotation system than a trading system. While brokers could survey bid and ask prices across the network of dealers in the search for the best trading opportunity, actual trades required direct negotiation (often over the phone) between the investor’s broker and the dealer in the security. However, as we will see shortly, NASDAQ has effectively evolved into an electronic market. While dealers still post bid and ask prices over the network, the bulk of trades are executed electronically, without need of direct negotiation.

Electronic Communication Networks (ECNs) Electronic communication networks allow participants to post market and limit orders over computer networks. The limit-order book is available to all participants. An example of such an order book from Archipelago, one of the leading ECNs, appeared in Figure 3.4. Orders that can be “crossed,” that is, matched against another order, are done so automatically without requiring the intervention of a broker. For example, an order to buy a share at a price of \$50 or lower will be immediately executed if there is an outstanding asked price of \$50. Therefore, ECNs are true trading systems, not merely price-quotation systems.

ECNs offer several attractions. Direct crossing of trades without using a broker-dealer system eliminates the bid–ask spread that otherwise would be incurred. Instead, trades are automatically crossed at a modest cost, typically less than a penny per share. ECNs are attractive as well because of the speed with which a trade can be executed. Finally, these systems offer investors considerable anonymity in their trades.

Specialist Markets In formal exchanges such as the New York Stock Exchange, trading in each security is managed by a **specialist** assigned responsibility for that security. Brokers who wish to buy or sell shares on behalf of their clients must direct the trade to the specialist’s post on the floor of the exchange.

Each security is assigned to one specialist, but each specialist firm—currently there are fewer than 10 on the NYSE—makes a market in many securities. This task may require the specialist to act as either a broker or a dealer. The specialist’s role as a broker is simply to execute the orders of other brokers. Specialists also may buy or sell shares of stock for their own portfolios. When no other trader can be found to take the other side of a trade, specialists will do so even if it means they must buy for or sell from their own accounts. Specialist firms earn income both from commissions for managing orders (as implicit brokers) and from the spreads at which they buy and sell securities (as implicit dealers).

Part of the specialist’s job as a broker is simply clerical. The specialist maintains a limit-order book of all outstanding unexecuted limit orders entered by brokers on behalf of clients. When limit orders can be executed at market prices, the specialist executes, or “crosses,” the trade.

The specialist is required to use the highest outstanding offered purchase price and the lowest outstanding offered selling price when matching trades. Therefore, the specialist system results in an auction market, meaning all buy and all sell orders come to one location, and the best orders “win” the trades. In this role, the specialist acts merely as a facilitator.

The more interesting function of the specialist is to maintain a “fair and orderly market” by acting as a dealer in the stock. In return for the exclusive right to make the market in a specific stock on the exchange, the specialist is required by the exchange to maintain an orderly market by buying and selling shares from inventory. Specialists maintain their own portfolios of stock and quoted bid and ask prices at which they are obligated to meet at least a limited amount of market orders.

Ordinarily, in an active market, specialists can match buy and sell orders without using their own accounts. That is, the specialist's own inventory of securities need not be the primary means of order execution. Sometimes, however, the specialist's bid and ask prices are better than those offered by any other market participant. Therefore, at any point, the effective ask price in the market is the lower of either the specialist's ask price or the lowest of the unfilled limit-sell orders. Similarly, the effective bid price is the highest of the unfilled limit-buy orders or the specialist's bid. These procedures ensure that the specialist provides liquidity to the market. In practice, specialists participate in approximately one-quarter of the transactions on the NYSE.

Specialists strive to maintain a narrow bid–ask spread for at least two reasons. First, one source of the specialist's income is frequent trading at the bid and ask prices, with the spread as a trading profit. A too-large spread would make the specialist's quotes uncompetitive with the limit orders placed by other traders. If the specialist's bid and asked quotes are consistently worse than those of public traders, the specialist will not participate in any trades and will lose the ability to profit from the bid–ask spread.

An equally important reason for narrow specialist spreads is that specialists are obligated to provide *price continuity* to the market. To illustrate price continuity, suppose the highest limit-buy order for a stock is \$30, while the lowest limit-sell order is \$32. When a market buy order comes in, it is matched to the best limit sell at \$32. A market sell order would be matched to the best limit buy at \$30. As market buys and sells come to the floor randomly, the stock price would fluctuate between \$30 and \$32. The exchange authorities would consider this excessive volatility, and the specialist would be expected to step in with bid and/or ask prices between these values to reduce the bid–ask spread to an acceptable level, typically below \$.05 for large firms. When a firm is newly listed on an exchange, specialist firms vigorously compete to be awarded the rights to maintain the market in those shares. Since specialists are evaluated in part on their past performance in maintaining price continuity, they have considerable incentive to maintain tight spreads.

3.3 U.S. SECURITIES MARKETS

We have briefly sketched the three major trading mechanisms used in the United States: over-the-counter dealer markets, exchange trading managed by specialists, and direct trading among brokers or investors over electronic networks. Originally, NASDAQ was primarily a dealer market and the NYSE was primarily a specialist market. As we will see, however, these markets have evolved in response to new information technology and both have dramatically increased their commitment to automated electronic trading.

NASDAQ

While any security can be traded in the over-the-counter network of security brokers and dealers, not all securities were included in the original National Association of Security Dealers Automated Quotations System. That system, now called the **NASDAQ Stock Market**, lists about 3,200 firms and offers three listing options. The NASDAQ Global Select Market lists over 1,000 of the largest, most actively traded firms, the NASDAQ Global Market is for the next tier of firms, and the NASDAQ Capital Market is the third tier of listed firms. Some of the requirements for initial listing are presented in Table 3.1. For even smaller firms that may not be eligible for listing or that wish to avoid disclosure requirements associated with listing on regulated markets, Pink Sheets LLC offers real-time stock quotes on www.pinksheets.com, as well as Pink Link, an electronic messaging and trade negotiation service.

TABLE 3.1

Partial requirements
for initial listing on
NASDAQ markets

| | NASDAQ Global Market | NASDAQ Capital Market |
|--|-------------------------|--------------------------|
| Shareholders' equity | \$15 million | \$5 million |
| Shares in public hands | 1.1 million | 1 million |
| Market value of publicly traded shares | \$8 million | \$5 million |
| Minimum price of stock | \$5 | \$4 |
| Pretax income | \$1 million | \$750,000 |
| Shareholders | 400 | 300 |

Source: The NASDAQ Stock Market, www.nasdaq.com. December 2006, The NASDAQ Stock Market, Inc. Reprinted with permission.

Because the NASDAQ system does not use a specialist, trades do not require a centralized trading floor as do exchange-listed stocks. Dealers can be located anywhere they can communicate effectively with other buyers and sellers.

NASDAQ has three levels of subscribers. The highest, level 3 subscribers, are for firms dealing, or “making markets,” in securities. These market makers maintain inventories of a security and constantly stand ready to buy or sell these shares from or to the public at the quoted bid and ask prices. They earn profits from the spread between the bid and ask prices. Level 3 subscribers may enter the bid and ask prices at which they are willing to buy or sell stocks into the computer network and may update these quotes as desired.

Level 2 subscribers receive all bid and ask quotes, but they cannot enter their own quotes. These subscribers tend to be brokerage firms that execute trades for clients but do not actively deal in the stocks on their own account. Brokers buying or selling shares trade with the market maker (a level 3 subscriber) displaying the best price quote.

Level 1 subscribers receive only the *inside quotes* (i.e., the highest bid and lowest ask prices on each stock). Level 1 subscribers tend to be investors who are not actively buying and selling securities but want information on current prices.

As noted, NASDAQ was originally more a price-quotation system than a trading system. But that has changed. Investors on NASDAQ today (through their brokers) typically access bids and offers electronically without human interaction. NASDAQ has steadily developed ever-more-sophisticated electronic trading platforms, which today handle the great majority of its trades. The latest version, called the NASDAQ Market Center, was introduced in 2004 and consolidates all of NASDAQ's previous electronic markets into one integrated system.

Market Center is NASDAQ's competitive response to the growing popularity of ECNs, which have captured a large share of order flow. By enabling automatic trade execution, Market Center allows NASDAQ to function much like an ECN. In addition, NASDAQ purchased the BRUT ECN and merged with Instinet, which runs the INET ECN, to capture a greater share of the electronic trading market. Nevertheless, larger orders may still be negotiated among brokers and dealers, so NASDAQ retains some features of a pure dealer market.

The New York Stock Exchange

The New York Stock Exchange is by far the largest **stock exchange** in the United States. Shares of about 2,800 firms trade there, with a combined market capitalization in early 2008 of around \$15 trillion. Daily trading on the NYSE averaged 2.1 billion shares in 2007, with a dollar value of approximately \$87 billion.

An investor who wishes to trade shares on the NYSE places an order with a brokerage firm, which either sends the order to the floor of the exchange via computer network or contacts its broker on the floor of the exchange to “work” the order. Smaller orders are

almost always sent electronically for automatic execution, while larger orders that may require negotiation or judgment are more likely sent to a floor broker. A floor broker sent a trade order takes the order to the specialist's post. At the post is a monitor called the Display Book that presents current offers from interested traders to buy or sell given numbers of shares at various prices. The specialist can cross the trade with that of another broker if that is feasible or match the trade using its own inventory of shares. Brokers might also seek out traders willing to take the other side of a trade at a price better than those currently appearing in the Display Book. If they can do so, they will bring the agreed-upon trade to the specialist for final execution.

Brokers must purchase the right to trade on the floor of the NYSE. Originally, the NYSE was organized as a not-for-profit company owned by its members or "seat holders." For example, in 2005 there were 1,366 seat-holding members of the NYSE. Each seat entitled its owner to place a broker on the floor of the exchange, where he or she could execute trades. Member firms could charge investors for executing trades on their behalf, which made a seat a valuable asset. The commissions that members might earn by trading on behalf of clients determined the market value of the seats, which were bought and sold like any other asset. Seat prices fluctuated widely, ranging from as low as \$4,000 (in 1878) to as high as \$4 million (in 2005).

More recently, however, many exchanges have decided to switch from a mutual form of organization, in which seat holders are joint owners, to publicly traded corporations owned by shareholders. In 2006, the NYSE merged with the Archipelago Exchange to form a publicly held company called the NYSE Group. (In 2007, the NYSE Group merged with Euronext to form NYSE Euronext.) As a publicly traded corporation, its share price rather than the price of a seat on the exchange is the best indicator of its financial health. Each seat on the exchange has been replaced by an annual license permitting traders to conduct business on the exchange floor.

The move toward public listing of exchanges is widespread. Other exchanges that have recently gone public include the Chicago Mercantile Exchange (derivatives trading, 2002), the International Securities Exchange (options, 2005), and the Chicago Board of Trade (derivatives, 2005), which has since merged with the CME. The Chicago Board Options Exchange reportedly also is considering going public.

Table 3.2 gives some of the initial listing requirements for the NYSE. These requirements ensure that a firm is of significant trading interest before the NYSE will allocate facilities for it to be traded on the floor of the exchange. If a listed company suffers a decline and fails to meet the criteria in Table 3.2, it may be delisted.

Regional exchanges and the Amex also sponsor trading of some firms that are listed on the NYSE. This arrangement enables local brokerage firms to trade in shares of large firms without obtaining a floor license on the NYSE.

About 75% of the share volume transacted in NYSE-listed securities actually is executed on the NYSE. The NYSE's market share measured by trades rather than share volume is considerably lower, as smaller retail orders are far more likely to be executed off the exchange. Nevertheless, the NYSE remains the venue of choice for large trades.

| | |
|--|---------------|
| Minimum annual pretax income in previous 2 years | \$ 2,000,000 |
| Revenue | \$ 75,000,000 |
| Market value of publicly held stock | \$100,000,000 |
| Shares publicly held | 1,100,000 |
| Number of holders of 100 shares or more | 2,200 |

TABLE 3.2

Some initial listing requirements for the NYSE

Source: New York Stock Exchange, www.nyse.com January 2007.

TABLE 3.3

Block transactions on the New York Stock Exchange

| Year | Shares (millions) | % Reported Volume | Average Number of Block Transactions per Day |
|------|-------------------|-------------------|--|
| 1965 | 48 | 3.1% | 9 |
| 1970 | 451 | 15.4 | 68 |
| 1975 | 779 | 16.6 | 136 |
| 1980 | 3,311 | 29.2 | 528 |
| 1985 | 14,222 | 51.7 | 2,139 |
| 1990 | 19,682 | 49.6 | 3,333 |
| 1995 | 49,737 | 57.0 | 7,793 |
| 2000 | 135,772 | 51.7 | 21,941 |
| 2005 | 112,027 | 27.7 | 17,445 |
| 2006 | 97,576 | 21.3 | 14,360 |
| 2007 | 57,079 | 10.7 | 7,332 |

Source: Data from the New York Stock Exchange, www.nyse.com.

Block Sales Institutional investors frequently trade blocks of tens of thousands of shares of stock. Table 3.3 shows that **block transactions** of over 10,000 shares account for a good deal of all trading on the NYSE. The larger block transactions are often too large for specialists to handle, as they do not wish to hold such large blocks of stock in their inventory. For example, one large block transaction in 2006 was for \$972 million worth of shares in Direct TV.

“Block houses” have evolved to aid in the placement of larger block trades. Block houses are brokerage firms that specialize in matching block buyers and sellers. Once a buyer and a seller have been matched, the block is sent to the exchange floor where specialists execute the trade. If a buyer cannot be found, the block house might purchase all or part of a block sale for its own account. The block house then can resell the shares to the public.

You can observe in Table 3.3 that the volume of block trading has declined dramatically in the last decade. This reflects changing trading practices since the advent of electronic markets. Large trades are now much more likely to be split up into multiple small trades and executed electronically. The lack of depth on the electronic exchanges reinforces this pattern: because the inside quote on these exchanges is valid only for small trades, it generally is preferable to buy or sell a large stock position in a series of smaller transactions.

SuperDot and Electronic Trading on the NYSE SuperDot is an electronic order-routing system that enables NYSE member firms to send market and limit orders directly to the specialist over computer lines. In 2006, it processed about 13 million trades per day, which were executed in a matter of seconds. The vast majority of all orders are submitted electronically through SuperDot, but these tend to be smaller orders, and account for about 70% of NYSE trading volume.

SuperDot is especially useful to program traders. A **program trade** is a coordinated purchase or sale of an entire portfolio of stocks. Many trading strategies (such as index arbitrage, a topic we will study in Chapter 23) require that an entire portfolio of stocks be purchased or sold simultaneously in a coordinated program. SuperDot is the tool that enables many trading orders to be sent out at once and executed almost simultaneously.

The NYSE has recently stepped up its commitment to electronic trading, instituting a fully automated trade-execution system called DirectPlus or Direct+. It matches orders against the inside bid or ask price with execution times of less than one-half second. In 2006, Direct+ handled about 17% of NYSE trade volume, largely because the system would accept only smaller trades (up to 1,099 shares). However, the NYSE is in the process of eliminating size and other limitations on Direct+ orders, so the fraction of shares cleared

electronically is quickly rising. In stocks for which the size limitation was eliminated in the latter part of 2006, electronic trades rose to 80% of share volume within 4 months.

Settlement Since June 1995, an order executed on the exchange must be settled within 3 working days. This requirement is often called T + 3, for trade date plus 3 days. The purchaser must deliver the cash, and the seller must deliver the stock to the broker, who in turn delivers it to the buyer's broker. Frequently, a firm's clients keep their securities in *street name*, which means the broker holds the shares registered in the firm's own name on behalf of the client. This convention can speed security transfer. T + 3 settlement has made such arrangements more important: It can be quite difficult for a seller of a security to complete delivery to the purchaser within the 3-day period if the stock is kept in a safe deposit box.

Settlement is simplified further by the existence of a clearinghouse. The trades of all exchange members are recorded each day, with members' transactions netted out, so that each member need transfer or receive only the net number of shares sold or bought that day. An exchange member then settles with the clearinghouse instead of individually with every firm with which it made trades.

Electronic Communication Networks

ECNs are private computer networks that directly link buyers with sellers. As an order is received, the system determines whether there is a matching order, and if so, the trade is executed immediately. Brokers that have an affiliation with an ECN have computer access and can enter orders in the limit-order book. Moreover, these brokers may make their terminals (or Internet access) available directly to individual traders who then can enter their own orders into the system.

ECNs have been highly successful and have captured more than half of the trading volume in NASDAQ-listed stocks. They must be certified by the SEC and registered with the National Association of Security Dealers to participate in the NASDAQ market. The two biggest ECNs by far are INET, formed by a merger of Island and Instinet, and Archipelago.

As noted, the NYSE and Archipelago have merged into a new publicly traded company called the NYSE Group (which then merged with Euronext). In principle, the merged firm can fill simple orders quickly without human interaction through ArcaEx (the Archipelago Exchange) and large complex orders using human traders on the floor of the NYSE. At the same time, NASDAQ purchased the other leading ECN, Instinet, which operates INET. Thus, the securities markets appear to be consolidating and it seems that each market will, at least for a time, offer multiple trading platforms.

The National Market System

The Securities Act Amendments of 1975 directed the Securities and Exchange Commission to implement a national competitive securities market. Such a market would entail centralized reporting of transactions as well as a centralized quotation system, with the aim of enhanced competition among market makers.

In 1975, Consolidated Tape began reporting trades on the NYSE, Amex, and major regional exchanges, as well as trades of NASDAQ-listed stocks. In 1977, the Consolidated Quotations Service began providing online bid and ask quotes for NYSE securities also traded on various other exchanges. In 1978, the Intermarket Trading System (ITS) was implemented. ITS currently links nine exchanges by computer: NYSE, Amex, Boston, National (formerly Cincinnati), Pacific, Philadelphia, Chicago, NASDAQ, and the Chicago Board Options Exchange. The system allows brokers and market makers to display and view quotes for all markets and to execute cross-market trades when the Consolidated Quotation System shows better prices in other markets.

However, the ITS has been only a limited success. Orders need to be directed to markets with the best prices by participants who might find it inconvenient or unprofitable to do so. However, the growth of automated electronic trading has made market integration more feasible. The SEC reaffirmed its so-called trade-through rule in 2005. Its Regulation NMS requires that investors' orders be filled at the best price that can be executed immediately, even if that price is available in a different market.

The trade-through rule is meant to improve speed of execution and enhance integration of competing stock markets. Linking these markets electronically through a unified book displaying all limit orders would be a logical extension of the ITS, enabling trade execution across markets. But this degree of integration has not yet been realized. Regulation NMS requires only that the inside quotes of each market be publicly shared. Because the inside or best quote is typically available only for a specified number of shares, there is still no guarantee that an investor will receive the best available prices for an entire trade, especially for larger trades.

Bond Trading

The New York Stock Exchange also operates a bond exchange where U.S. government, corporate, municipal, and foreign bonds may be traded. The centerpiece of the NYSE bond market is the Automated Bond System (ABS), which is an automated trading system that allows trading firms to obtain market information, to enter and execute trades over a computer network, and to receive immediate confirmations of trade execution.

However, the vast majority of bond trading occurs in the OTC market among bond dealers, even for bonds that are actually listed on the NYSE. This market is a network of bond dealers such as Merrill Lynch, Salomon Smith Barney (a division of Citigroup), or Goldman, Sachs that is linked by a computer quotation system. However, because these dealers do not carry extensive inventories of the wide range of bonds that have been issued to the public, they cannot necessarily offer to sell bonds from their inventory to clients or even buy bonds for their own inventory. They may instead work to locate an investor who wishes to take the opposite side of a trade. In practice, however, the corporate bond market often is quite "thin," in that there may be few investors interested in trading a specific bond at any particular time. As a result, the bond market is subject to a type of liquidity risk, for it can be difficult to sell one's holdings quickly if the need arises.

In 2006, the NYSE obtained regulatory approval to expand its bond trading system to include the debt issues of any NYSE-listed firm. In the past, each bond needed to be registered before listing; such a requirement was too onerous to justify listing most bonds. With the change, the NYSE now lists about 6,000 bond issues, an enormous increase from the roughly 1,000 bonds listed in 2006. In conjunction with these new listings, the NYSE has expanded its electronic bond-trading platform, which is now called NYSE Bonds. If the new trading system is successful, it will provide an alternative to the over-the-counter dealer market in bonds and improve the transparency of bond pricing for the public.

3.4

MARKET STRUCTURE IN OTHER COUNTRIES

The structure of security markets varies considerably from one country to another. A full cross-country comparison is far beyond the scope of this text. Therefore, we will instead briefly review three of the biggest non-U.S. stock markets: the London, Euronext,

and Tokyo exchanges. Figure 3.6 shows the market capitalization of firms trading in the major world stock markets.

London

The London Stock Exchange uses an electronic trading system dubbed SETS (Stock Exchange Electronic Trading Service) for trading in large, liquid securities. This is an electronic clearing system similar to ECNs in which buy and sell orders are submitted via computer networks and any buy and sell orders that can be crossed are executed automatically. However, less-liquid shares are traded in a more traditional dealer market called the SEAQ (Stock Exchange Automated Quotations) system, where market makers enter bid and ask prices at which they are willing to transact.

Euronext

Euronext was formed in 2000 by a merger of the Paris, Amsterdam, and Brussels exchanges and itself merged with the NYSE Group in 2007. Euronext, like most European exchanges, uses an electronic trading system. Its system, called NSC (for Nouveau Système de Cotation, or New Quotation System), has fully automated order routing and execution. In fact, investors can enter their orders directly without contacting their brokers. An order submitted to the system is executed immediately if it can be crossed against an order in the public limit-order book; if it cannot be executed, it is entered into the limit-order book.

Euronext has established cross-trading agreements with several other European exchanges such as Helsinki or Luxembourg. In 2001, it also purchased LIFFE, the London International Financial Futures and Options Exchange.

Tokyo

The Tokyo Stock Exchange (TSE) is among the largest in the world, measured either by trading volume or the market capitalization of its roughly 2,400 listed firms. It exemplifies many of the general trends that we have seen affecting stock markets throughout the world. In 1999, it closed its trading floor and switched to all-electronic trading. It switched from a membership form of organization to a corporate form in 2001.

The TSE maintains three “sections.” The First section is for large companies, the Second is for mid-sized firms, and the “Mothers” section is for emerging and high-growth stocks. About three-quarters of all listed firms trade on the First section, and about 200 trade in the Mothers section.

The two major stock market indexes for the TSE are the Nikkei 225 index, which is a price-weighted average of 225 top-tier Japanese firms, and the TOPIX index, which is a value-weighted index of the First section companies.

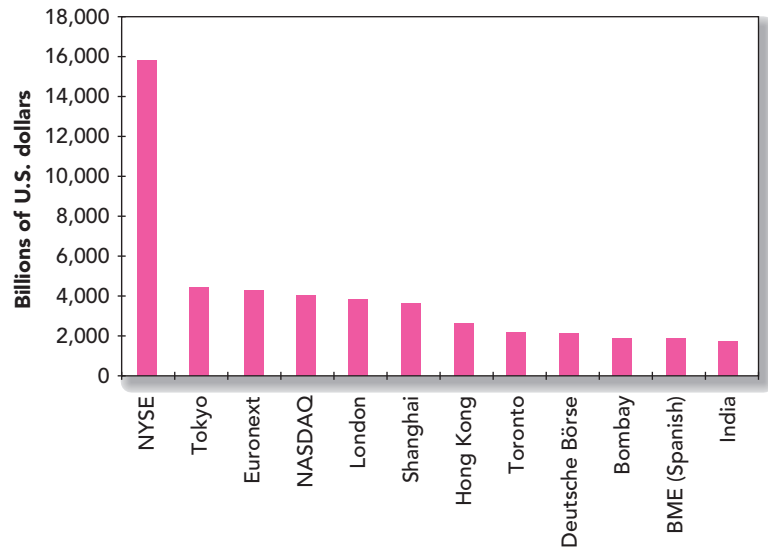


FIGURE 3.6 Market capitalization of major world stock exchanges

Source: World Federation of Exchanges.

Globalization and Consolidation of Stock Markets

All stock markets have come under increasing pressure in recent years to make international alliances or mergers. Much of this pressure is due to the impact of electronic trading. To a growing extent, traders view stock markets as computer networks that link them to other traders, and there are increasingly fewer limits on the securities around the world that they can trade. Against this background, it becomes more important for exchanges to provide the cheapest and most efficient mechanism by which trades can be executed and cleared. This argues for global alliances that can facilitate the nuts and bolts of cross-border trading and can benefit from economies of scale. Moreover, in the face of competition from electronic networks, established exchanges feel that they eventually need to offer 24-hour global markets and platforms that allow trading of different security types, for example, both stocks and derivatives. Finally, companies want to be able to go beyond national borders when they wish to raise capital.

These pressures have resulted in a broad trend toward market consolidation. In the last decade, most of the mergers were “local,” that is, involving exchanges operating in the same continent. In the U.S., the NYSE merged with the Archipelago ECN, and in 2008 announced a deal to acquire the American Stock Exchange. NASDAQ acquired Instinet (which operated the other major ECN, INET) in 2005 and the Boston Stock Exchange in 2007, and, in the derivatives market, the Chicago Mercantile Exchange (CME) acquired the Chicago Board of Trade. In 2008, the CME entered into merger talks with the New York Mercantile Exchange. In Europe, Euronext was formed by the merger of the Paris, Brussels, Lisbon, and Amsterdam exchanges and shortly thereafter purchased Liffe, the derivatives exchange based in London. Now a new wave of intercontinental mergers seems to be brewing. The NYSE Group and Euronext merged in 2007. The NYSE has purchased 5% of India’s National Stock Exchange and has entered a cooperation agreement with the Tokyo Stock Exchange. In March 2006, NASDAQ made an offer to acquire the London Stock Exchange, but the LSE rejected that proposal. However, NASDAQ appears finally to have established a foothold in Europe in 2007, when it joined forces with Börse Dubai to acquire the Swedish exchange OMX. In the derivatives market, Deutsche Börse agreed to buy International Securities Exchange Holdings.

3.5 TRADING COSTS

Part of the cost of trading a security is obvious and explicit. Your broker must be paid a commission. Individuals may choose from two kinds of brokers: full-service or discount brokers. Full-service brokers who provide a variety of services often are referred to as account executives or financial consultants.

Besides carrying out the basic services of executing orders, holding securities for safe-keeping, extending margin loans, and facilitating short sales, brokers routinely provide information and advice relating to investment alternatives.

Full-service brokers usually depend on a research staff that prepares analyses and forecasts of general economic as well as industry and company conditions and often makes specific buy or sell recommendations. Some customers take the ultimate leap of faith and allow a full-service broker to make buy and sell decisions for them by establishing a *discretionary account*. In this account, the broker can buy and sell prespecified securities whenever deemed fit. (The broker cannot withdraw any funds, though.) This action requires an unusual degree of trust on the part of the customer, for an unscrupulous broker can “churn” an account, that is, trade securities excessively with the sole purpose of generating commissions.

Discount brokers, on the other hand, provide “no-frills” services. They buy and sell securities, hold them for safekeeping, offer margin loans, facilitate short sales, and that is all. The only information they provide about the securities they handle is price quotations. Discount brokerage services have become increasingly available in recent years. Many banks, thrift institutions, and mutual fund management companies now offer such services to the investing public as part of a general trend toward the creation of one-stop “financial supermarkets.” Stock trading fees have fallen steadily over the last decade, and discount brokerage firms such as Schwab, E*Trade, or Ameritrade now offer commissions below \$15 or even less than \$10 for preferred customers.

In addition to the explicit part of trading costs—the broker’s commission—there is an implicit part—the dealer’s bid–ask spread. Sometimes the broker is also a dealer in the security being traded and charges no commission but instead collects the fee entirely in the form of the bid–ask spread. Another implicit cost of trading that some observers would distinguish is the price concession an investor may be forced to make for trading in any quantity that exceeds the quantity the dealer is willing to trade at the posted bid or asked price.

An ongoing controversy between the NYSE and its competitors is the extent to which better execution on the NYSE offsets the generally lower explicit costs of trading in other markets. Execution refers to the size of the effective bid–ask spread and the possibility of price improvement in a market. The NYSE believes that many investors focus too intently on the costs they can see, despite the fact that quality of execution can be a far more important determinant of total costs. Many NYSE trades are executed at a price inside the quoted spread. This can happen because floor brokers at the specialist’s post can bid above or sell below the specialist’s quote. In this way, two public orders can cross without incurring the specialist’s spread.

To illustrate, suppose IBM is trading at \$83.03 bid, \$83.07 asked. A broker who has received a market buy order can meet a broker with a market sell order, and agree to a price of \$83.05. By meeting in the middle of the quoted spread, both buyer and seller obtain “price improvement,” that is, transaction prices better than the best quoted prices. Such “meetings” of brokers are more than accidental. Because all trading takes place at the specialist’s post, floor brokers know where to look for counterparties to a trade.

3.6 BUYING ON MARGIN

When purchasing securities, investors have easy access to a source of debt financing called *broker’s call loans*. The act of taking advantage of broker’s call loans is called *buying on margin*.

Purchasing stocks on margin means the investor borrows part of the purchase price of the stock from a broker. The **margin** in the account is the portion of the purchase price contributed by the investor; the remainder is borrowed from the broker. The brokers in turn borrow money from banks at the call money rate to finance these purchases; they then charge their clients that rate (defined in Chapter 2), plus a service charge for the loan. All securities purchased on margin must be maintained with the brokerage firm in street name, for the securities are collateral for the loan.

The Board of Governors of the Federal Reserve System limits the extent to which stock purchases can be financed using margin loans. The current initial margin requirement is 50%, meaning that at least 50% of the purchase price must be paid for in cash, with the rest borrowed.

EXAMPLE 3.1 Margin

The percentage margin is defined as the ratio of the net worth, or the “equity value,” of the account to the market value of the securities. To demonstrate, suppose an investor initially pays \$6,000 toward the purchase of \$10,000 worth of stock (100 shares at \$100 per share), borrowing the remaining \$4,000 from a broker. The initial balance sheet looks like this:

| Assets | | Liabilities and Owners' Equity | |
|----------------|----------|--------------------------------|---------|
| Value of stock | \$10,000 | Loan from broker | \$4,000 |
| | | Equity | \$6,000 |

The initial percentage margin is

$$\text{Margin} = \frac{\text{Equity in account}}{\text{Value of stock}} = \frac{\$6,000}{\$10,000} = .60, \text{ or } 60\%$$

If the price declines to \$70 per share, the account balance becomes:

| Assets | | Liabilities and Owners' Equity | |
|----------------|---------|--------------------------------|---------|
| Value of stock | \$7,000 | Loan from broker | \$4,000 |
| | | Equity | \$3,000 |

The assets in the account fall by the full decrease in the stock value, as does the equity. The percentage margin is now

$$\text{Margin} = \frac{\text{Equity in account}}{\text{Value of stock}} = \frac{\$3,000}{\$7,000} = .43, \text{ or } 43\%$$

If the stock value in Example 3.1 were to fall below \$4,000, owners' equity would become negative, meaning the value of the stock is no longer sufficient collateral to cover the loan from the broker. To guard against this possibility, the broker sets a *maintenance margin*. If the percentage margin falls below the maintenance level, the broker will issue a *margin call*, which requires the investor to add new cash or securities to the margin account. If the investor does not act, the broker may sell securities from the account to pay off enough of the loan to restore the percentage margin to an acceptable level.

EXAMPLE 3.2 Maintenance Margin

Suppose the maintenance margin is 30%. How far could the stock price fall before the investor would get a margin call?

Let P be the price of the stock. The value of the investor's 100 shares is then $100P$, and the equity in the account is $100P - \$4,000$. The percentage margin is $(100P - \$4,000)/100P$. The price at which the percentage margin equals the maintenance margin of .3 is found by solving the equation

$$\frac{100P - 4,000}{100P} = .3$$

which implies that $P = \$57.14$. If the price of the stock were to fall below \$57.14 per share, the investor would get a margin call.

eXcel APPLICATIONS: Buying on Margin

The Online Learning Center (www.mhhe.com/bkm) contains the Excel spreadsheet model below, which makes it easy to analyze the impacts of different margin

levels and the volatility of stock prices. It also allows you to compare return on investment for a margin trade with a trade using no borrowed funds.

| | A | B | C | D | E | F | G | H |
|----|---------------------------------|-------------|--------------------------|-----------------|-------------------|---|------------------|--------------------|
| 1 | | | | | | | | |
| 2 | | | Action or Formula | Ending | Return on | | Ending | Return with |
| 3 | | | for Column B | St Price | Investment | | St Price | No Margin |
| 4 | Initial Equity Investment | \$10,000.00 | Enter data | | -41.60% | | | -18.80% |
| 5 | Amount Borrowed | \$10,000.00 | (B4/B10)-B4 | \$20.00 | -121.60% | | \$20.00 | -58.80% |
| 6 | Initial Stock Price | \$50.00 | Enter data | 25.00 | -101.60% | | 25.00 | -48.80% |
| 7 | Shares Purchased | 400 | (B4/B10)/B6 | 30.00 | -81.60% | | 30.00 | -38.80% |
| 8 | Ending Stock Price | \$40.00 | Enter data | 35.00 | -61.60% | | 35.00 | -28.80% |
| 9 | Cash Dividends During Hold Per. | \$0.60 | Enter data | 40.00 | -41.60% | | 40.00 | -18.80% |
| 10 | Initial Margin Percentage | 50.00% | Enter data | 45.00 | -21.60% | | 45.00 | -8.80% |
| 11 | Maintenance Margin Percentage | 30.00% | Enter data | 50.00 | -1.60% | | 50.00 | 1.20% |
| 12 | | | | 55.00 | 18.40% | | 55.00 | 11.20% |
| 13 | Rate on Margin Loan | 8.00% | Enter data | 60.00 | 38.40% | | 60.00 | 21.20% |
| 14 | Holding Period in Months | 6 | Enter data | 65.00 | 58.40% | | 65.00 | 31.20% |
| 15 | | | | 70.00 | 78.40% | | 70.00 | 41.20% |
| 16 | Return on Investment | | | 75.00 | 98.40% | | 75.00 | 51.20% |
| 17 | Capital Gain on Stock | -\$4,000.00 | B7*(B8-B6) | 80.00 | 118.40% | | 80.00 | 61.20% |
| 18 | Dividends | \$240.00 | B7*B9 | | | | | |
| 19 | Interest on Margin Loan | \$400.00 | B5*(B14/12)*B13 | | | | | |
| 20 | Net Income | -\$4,160.00 | B17+B18-B19 | | | | | |
| 21 | Initial Investment | \$10,000.00 | B4 | | | | | |
| 22 | Return on Investment | -41.60% | B20/B21 | | | | | |
| | | | | | | | LEGEND: | |
| | | | | | | | Enter data | |
| | | | | | | | Value calculated | |

Why do investors buy securities on margin? They do so when they wish to invest an amount greater than their own money allows. Thus, they can achieve greater upside potential, but they also expose themselves to greater downside risk.

CONCEPT CHECK 4

Suppose the maintenance margin in Example 3.2 is 40%. How far can the stock price fall before the investor gets a margin call?

To see how, let's suppose an investor is bullish on IBM stock, which is selling for \$100 per share. An investor with \$10,000 to invest expects IBM to go up in price by 30% during the next year. Ignoring any dividends, the expected rate of return would be 30% if the investor invested \$10,000 to buy 100 shares.

But now assume the investor borrows another \$10,000 from the broker and invests it in IBM, too. The total investment in IBM would be \$20,000 (for 200 shares). Assuming an interest rate on the margin loan of 9% per year, what will the investor's rate of return be now (again ignoring dividends) if IBM stock goes up 30% by year's end?

The 200 shares will be worth \$26,000. Paying off \$10,900 of principal and interest on the margin loan leaves \$15,100 (i.e., \$26,000 - \$10,900). The rate of return in this case will be

$$\frac{\$15,100 - \$10,000}{\$10,000} = 51\%$$

The investor has parlayed a 30% rise in the stock's price into a 51% rate of return on the \$10,000 investment.

Doing so, however, magnifies the downside risk. Suppose that, instead of going up by 30%, the price of IBM stock goes down by 30% to \$70 per share. In that case, the 200 shares

TABLE 3.4

Illustration of buying stock on margin

| Change in Stock Price | End-of-Year Value of Shares | Repayment of Principal and Interest* | Investor's Rate of Return |
|-----------------------|-----------------------------|--------------------------------------|---------------------------|
| 30% increase | \$26,000 | \$10,900 | 51% |
| No change | 20,000 | 10,900 | -9 |
| 30% decrease | 14,000 | 10,900 | -69 |

*Assuming the investor buys \$20,000 worth of stock, borrowing \$10,000 of the purchase price at an interest rate of 9% per year.

will be worth \$14,000, and the investor is left with \$3,100 after paying off the \$10,900 of principal and interest on the loan. The result is a disastrous return of

$$\frac{\$3,100 - \$10,000}{\$10,000} = -69\%$$

Table 3.4 summarizes the possible results of these hypothetical transactions. If there is no change in IBM's stock price, the investor loses 9%, the cost of the loan.

CONCEPT CHECK**5**

Suppose that in this margin example, the investor borrows only \$5,000 at the same interest rate of 9% per year. What will the rate of return be if the price of IBM goes up by 30%? If it goes down by 30%? If it remains unchanged?

3.7 SHORT SALES

Normally, an investor would first buy a stock and later sell it. With a short sale, the order is reversed. First, you sell and then you buy the shares. In both cases, you begin and end with no shares.

A **short sale** allows investors to profit from a decline in a security's price. An investor borrows a share of stock from a broker and sells it. Later, the short-seller must purchase a share of the same stock in order to replace the share that was borrowed. This is called *covering the short position*. Table 3.5 compares stock purchases to short sales.

The short-seller anticipates the stock price will fall, so that the share can be purchased later at a lower price than it initially sold for; if so, the short-seller will reap a profit. Short-sellers must not only replace the shares but also pay the lender of the security any dividends paid during the short sale.

In practice, the shares loaned out for a short sale are typically provided by the short-seller's brokerage firm, which holds a wide variety of securities of its other investors in street name (i.e., the broker holds the shares registered in its own name on behalf of the client). The owner of the shares need not know that the shares have been lent to the short-seller. If the owner wishes to sell the shares, the brokerage firm will simply borrow shares from another investor. Therefore, the short sale may have an indefinite term. However, if the brokerage firm cannot locate new shares to replace the ones sold, the short-seller will need to repay the loan immediately by purchasing shares in the market and turning them over to the brokerage house to close out the loan.

eXcel APPLICATIONS: short sale

The Online Learning Center (www.mhhe.com/bkm) contains this Excel spreadsheet model, built using the text example for Dot Bomb. The model allows you to analyze the effects of returns, margin calls, and

different levels of initial and maintenance margins. The model also includes a sensitivity analysis for ending stock price and return on investment.

| | A | B | C | D | E |
|----|-------------------------------|-------------|---|----------------------------|---------------------------------|
| 1 | | | | | |
| 2 | | | | | |
| 3 | | | Action or Formula for Column B | Ending St Price | Return on Investment |
| 4 | Initial Investment | \$50,000.00 | Enter data | | 60.00% |
| 5 | Initial Stock Price | \$100.00 | Enter data | \$170.00 | -140.00% |
| 6 | Number of Shares Sold Short | 1,000 | (B4/B9)/B5 | 160.00 | -120.00% |
| 7 | Ending Stock Price | \$70.00 | Enter data | 150.00 | -100.00% |
| 8 | Cash Dividends Per Share | \$0.00 | Enter data | 140.00 | -80.00% |
| 9 | Initial Margin Percentage | 50.00% | Enter data | 130.00 | -60.00% |
| 10 | Maintenance Margin Percentage | 30.00% | Enter data | 120.00 | -40.00% |
| 11 | | | | 110.00 | -20.00% |
| 12 | Return on Short Sale | | | 100.00 | 0.00% |
| 13 | Capital Gain on Stock | \$30,000.00 | B6*(B5-B7) | 90.00 | 20.00% |
| 14 | Dividends Paid | \$0.00 | B8*B6 | 80.00 | 40.00% |
| 15 | Net Income | \$30,000.00 | B13-B14 | 70.00 | 60.00% |
| 16 | Initial Investment | \$50,000.00 | B4 | 60.00 | 80.00% |
| 17 | Return on Investment | 60.00% | B15/B16 | 50.00 | 100.00% |
| 18 | | | | 40.00 | 120.00% |
| 19 | Margin Positions | | | 30.00 | 140.00% |
| 20 | Margin Based on Ending Price | 114.29% | (B4+(B5*B6)-B14-(B6*B7))/(B6*B7) | 20.00 | 160.00% |
| 21 | | | | 10.00 | 180.00% |
| 22 | Price for Margin Call | \$115.38 | (B4+(B5*B6)-B14)/(B6*(1+B10)) | | |
| 23 | | | | | |
| 24 | | | | | |
| 25 | | | | | |

Finally, exchange rules require that proceeds from a short sale must be kept on account with the broker. The short-seller cannot invest these funds to generate income, although large or institutional investors typically will receive some income from the proceeds of a short sale being held with the broker. Short-sellers also are required to post margin (cash or collateral) with the broker to cover losses should the stock price rise during the short sale.

| Purchase of Stock | | |
|--|---|----------------------------|
| Time | Action | Cash Flow* |
| 0 | Buy share | - Initial price |
| 1 | Receive dividend, sell share | Ending price + Dividend |
| Profit = (Ending price + Dividend) - Initial price | | |
| Short Sale of Stock | | |
| Time | Action | Cash Flow* |
| 0 | Borrow share; sell it | + Initial price |
| 1 | Repay dividend and buy share to replace the share originally borrowed | -(Ending price + Dividend) |
| Profit = Initial price - (Ending price + Dividend) | | |

*A negative cash flow implies a cash outflow.

TABLE 3.5

Cash flows from purchasing versus short-selling shares of stock

EXAMPLE 3.3 Short Sales

To illustrate the mechanics of short-selling, suppose you are bearish (pessimistic) on Dot Bomb stock, and its market price is \$100 per share. You tell your broker to sell short 1,000 shares. The broker borrows 1,000 shares either from another customer's account or from another broker.

The \$100,000 cash proceeds from the short sale are credited to your account. Suppose the broker has a 50% margin requirement on short sales. This means you must have other cash or securities in your account worth at least \$50,000 that can serve as margin on the short sale. Let's say that you have \$50,000 in Treasury bills. Your account with the broker after the short sale will then be:

| Assets | | Liabilities and Owners' Equity | |
|---------|-----------|---|-----------|
| Cash | \$100,000 | Short position in Dot Bomb stock (1,000 shares owed) | \$100,000 |
| T-bills | 50,000 | Equity | 50,000 |

Your initial percentage margin is the ratio of the equity in the account, \$50,000, to the current value of the shares you have borrowed and eventually must return, \$100,000:

$$\text{Percentage margin} = \frac{\text{Equity}}{\text{Value of stock owed}} = \frac{\$50,000}{\$100,000} = .50$$

Suppose you are right and Dot Bomb falls to \$70 per share. You can now close out your position at a profit. To cover the short sale, you buy 1,000 shares to replace the ones you borrowed. Because the shares now sell for \$70, the purchase costs only \$70,000.⁴ Because your account was credited for \$100,000 when the shares were borrowed and sold, your profit is \$30,000: The profit equals the decline in the share price times the number of shares sold short.

Like investors who purchase stock on margin, a short-seller must be concerned about margin calls. If the stock price rises, the margin in the account will fall; if margin falls to the maintenance level, the short-seller will receive a margin call.

EXAMPLE 3.4 Margin Calls on Short Positions

Suppose the broker has a maintenance margin of 30% on short sales. This means the equity in your account must be at least 30% of the value of your short position at all times. How much can the price of Dot Bomb stock rise before you get a margin call?

Let P be the price of Dot Bomb stock. Then the value of the shares you must pay back is $1,000P$ and the equity in your account is $\$150,000 - 1,000P$. Your short position

⁴Notice that when buying on margin, you borrow a given amount of dollars from your broker, so the amount of the loan is independent of the share price. In contrast, when short-selling you borrow a given number of shares, which must be returned. Therefore, when the price of the shares changes, the value of the loan also changes.

margin ratio is equity/value of stock = $(150,000 - 1,000P)/1,000P$. The critical value of P is thus

$$\frac{\text{Equity}}{\text{Value of shares owed}} = \frac{150,000 - 1,000P}{1,000P} = .3$$

which implies that $P = \$115.38$ per share. If Dot Bomb stock should *rise* above \$115.38 per share, you will get a margin call, and you will either have to put up additional cash or cover your short position by buying shares to replace the ones borrowed.

CONCEPT CHECK

6

- Construct the balance sheet if Dot Bomb in Example 3.4 goes up to \$110.
- If the short position maintenance margin in the Dot Bomb example is 40%, how far can the stock price rise before the investor gets a margin call?

You can see now why stop-buy orders often accompany short sales. Imagine that you short-sell Dot Bomb when it is selling at \$100 per share. If the share price falls, you will profit from the short sale. On the other hand, if the share price rises, let's say to \$130, you will lose \$30 per share. But suppose that when you initiate the short sale, you also enter a stop-buy order at \$120. The stop-buy will be executed if the share price surpasses \$120, thereby limiting your losses to \$20 per share. (If the stock price drops, the stop-buy will never be executed.) The stop-buy order thus provides protection to the short-seller if the share price moves up.

3.8 REGULATION OF SECURITIES MARKETS

Trading in securities markets in the United States is regulated by a myriad of laws. The major governing legislation includes the Securities Act of 1933 and the Securities Exchange Act of 1934. The 1933 Act requires full disclosure of relevant information relating to the issue of new securities. This is the act that requires registration of new securities and issuance of a prospectus that details the financial prospects of the firm. SEC approval of a prospectus or financial report is not an endorsement of the security as a good investment. The SEC cares only that the relevant facts are disclosed; investors must make their own evaluation of the security's value.

The 1934 Act established the Securities and Exchange Commission to administer the provisions of the 1933 Act. It also extended the disclosure principle of the 1933 Act by requiring periodic disclosure of relevant financial information by firms with already-issued securities on secondary exchanges.

The 1934 Act also empowers the SEC to register and regulate securities exchanges, OTC trading, brokers, and dealers. While the SEC is the administrative agency responsible for broad oversight of the securities markets, it shares responsibility with other regulatory agencies. The Commodity Futures Trading Commission (CFTC) regulates trading in futures markets, while the Federal Reserve has broad responsibility for the health of the U.S. financial system. In this role, the Fed sets margin requirements on stocks and stock options and regulates bank lending to security market participants.

The Securities Investor Protection Act of 1970 established the Securities Investor Protection Corporation (SIPC) to protect investors from losses if their brokerage firms fail.

Just as the Federal Deposit Insurance Corporation provides depositors with federal protection against bank failure, the SIPC ensures that investors will receive securities held for their account in street name by a failed brokerage firm up to a limit of \$500,000 per customer. The SIPC is financed by levying an “insurance premium” on its participating, or member, brokerage firms.

In addition to federal regulations, security trading is subject to state laws, known generally as *blue sky laws* because they are intended to give investors a clearer view of investment prospects. State laws to outlaw fraud in security sales existed before the Securities Act of 1933. Varying state laws were somewhat unified when many states adopted portions of the Uniform Securities Act, which was enacted in 1956.

Self-Regulation

Although the SEC is charged with oversight of the securities markets and participating firms, in practice it delegates much of its work to the exchanges themselves. The stock markets are therefore largely self-regulating organizations. The National Association of Securities Dealers (NASD) oversees participants in the NASDAQ stock market, and the NYSE has its own regulatory arm. NYSE Regulation, Inc., was created during the merger between the NYSE and Archipelago and is now a subsidiary of NYSE Euronext. It is charged with monitoring and regulating the activities of NYSE member firms and listed companies, and enforcing compliance with both NYSE rules and federal securities laws. At the end of 2006, the NYSE and NASD agreed to merge portions of their regulatory arms into one agency to reduce the costs of overlapping and redundant regulation. The plan is to consolidate routine examinations, rule-making, enforcement, and arbitration into one “self-regulatory organization,” or SRO.

In addition to exchange regulation, there is also self-regulation among the community of investment professionals. For example, the CFA Institute has developed standards of professional conduct that govern the behavior of members with the Chartered Financial Analysts designation, commonly referred to as CFAs. The nearby box presents a brief outline of those principles.

Regulatory Responses to Recent Scandals

The scandals of 2000–2002 centered largely on three broad practices: allocations of shares in initial public offerings, tainted securities research and recommendations put out to the public, and, probably most important, misleading financial statements and accounting practices. The regulatory response to these issues is still evolving, but some initiatives have been put in place. Many of these are contained in the Sarbanes-Oxley Act passed by Congress in 2002. Among the key reforms are:

- Creation of a Public Company Accounting Oversight Board to oversee the auditing of public companies.
- Rules requiring independent financial experts to serve on audit committees of a firm’s board of directors.
- CEOs and CFOs must now personally certify that their firms’ financial reports “fairly represent, in all material respects, the operations and financial condition of the company,” and are subject to personal penalties if those reports turn out to be misleading. Following the letter of GAAP rules may still be necessary, but it is no longer sufficient accounting practice.
- Auditors may no longer provide several other services to their clients. This is intended to prevent potential profits on consulting work from influencing the quality of their audit.

EXCERPTS FROM CFA INSTITUTE STANDARDS OF PROFESSIONAL CONDUCT

I. Professionalism

- Knowledge of law. Members must understand, have knowledge of, and comply with all applicable laws, rules, and regulations including the Code of Ethics and Standards of Professional Conduct.
- Independence and objectivity. Members shall maintain independence and objectivity in their professional activities.
- Misrepresentation. Members must not knowingly misrepresent investment analysis, recommendations, or other professional activities.

II. Integrity of Capital Markets

- Non-public information. Members must not exploit material non-public information.
- Market manipulation. Members shall not attempt to distort prices or trading volume with the intent to mislead market participants.

III. Duties to Clients

- Loyalty, prudence, and care. Members must place their clients' interests before their own and act with reasonable care on their behalf.
- Fair dealing. Members shall deal fairly and objectively with clients when making investment recommendations or taking actions.
- Suitability. Members shall make a reasonable inquiry into a client's financial situation, investment experience, and investment objectives prior to making appropriate investment recommendations.
- Performance presentation. Members shall attempt to ensure that investment performance is presented fairly, accurately, and completely.
- Confidentiality. Members must keep information about clients confidential unless the client permits disclosure.

IV. Duties to Employers

- Loyalty. Members must act for the benefit of their employer.
- Compensation. Members must not accept compensation from sources that would create a conflict of interest with their employer's interests without written consent from all involved parties.
- Supervisors. Members must make reasonable efforts to detect and prevent violation of applicable laws and regulations by anyone subject to their supervision.

V. Investment Analysis and Recommendations

- Diligence. Members must exercise diligence and have reasonable basis for investment analysis, recommendations, or actions.
- Communication. Members must distinguish fact from opinion in their presentation of analysis and disclose general principles of investment processes used in analysis.

VI. Conflicts of Interest

- Disclosure of conflicts. Members must disclose all matters that reasonably could be expected to impair their objectivity or interfere with their other duties.
- Priority of transactions. Transactions for clients and employers must have priority over transactions for the benefit of a member.

VII. Responsibilities as Member of CFA Institute

- Conduct. Members must not engage in conduct that compromises the reputation or integrity of the CFA Institute or CFA designation.

Source: Summary of the Code of Ethics and Standards of Professional Conduct of the CFA Institute. Copyright 2005, CFA Institute. Reproduced with permission from the CFA Institute. All rights reserved. www.cfainstitute.org/centre/ethics/code/pdf/english_code.pdf.

- The Board of Directors must be composed of independent directors and hold regular meetings of directors in which company management is not present (and therefore cannot impede or influence the discussion).

More recently, there has been a fair amount of push-back on Sarbanes-Oxley. Many observers believe that the compliance costs associated with the law are too onerous, especially for smaller firms, and that heavy-handed regulatory oversight is giving foreign locales an undo advantage over the United States when firms decide where to list their

THE RULES OF THE GAME

Financial innovation has proceeded at a head-spinning rate in recent years. Hedge funds have ballooned to account for more than \$1.3 trillion in assets worldwide. They also bear some responsibility for the growing volatility of global financial markets and pose difficult questions for regulators. Complex new products that are created in one financial center involve assets in another and are sold to investors in a third, so who is supposed to keep an eye on them?

It is up to regulators to sort out the balance between control and adaptability, but the complexities of rapid trading, particularly across multiple borders and asset classes, are stretching the capacity of even the most sophisticated regulators. There is talk of “regulatory arbitrage”, meaning that financial firms look for the most favorable environments to operate in.

Current American financial regulation—divided among many agencies at both federal and state levels—strikes many firms as complex and confusing. The Securities and Exchange Commission (SEC), which regulates share trading, banks and other parts of the financial markets, takes a “rules-based” approach, spelling out in detail what can and cannot be done. The Commodities Futures Trading Commission (CFTC), which monitors the futures markets, is generally more risk-based and less legalistic than the SEC—more like Britain’s Financial Services Authority (FSA).

The debate over regulation is noisiest in America. There are worries in financial circles that markets there may be losing some of their business to financial centers abroad. The Sarbanes-Oxley act, passed

five years ago, which imposed far tougher controls on public companies, is also often blamed for making America a less attractive place for doing business. Many in the financial community have called for America to combine its jumble of financial regulators under a single umbrella, as Britain has done with the FSA, but views on what exactly should be done are far from unanimous.

Britain’s financial system, which has served as a model for regulators from Hong Kong to Dubai, is based on broad principles and “risk-based” regulation. Stocks, futures products, banking, insurance and over-the-counter products (private transactions between parties) are grouped under a single regulator, the FSA.

Yet there is an added layer of regulatory complication in Europe as the European Commission in Brussels pushes for a single regional market in financial services. From November 2007, European financial-services providers will be subject to the Markets in Financial Instruments Directive (MiFID), designed to increase competition and improve transparency across a broad swathe of financial services.

Because of the increasingly global nature of capital markets, these regulations are being tested in new ways. The growing volume of cross-border exchange deals, for instance, has forced regulators to work much more closely together. “Just as the United States can’t go it alone, neither can any other country,” says Christopher Cox, chairman of America’s SEC.

Source: *The Economist*, September 13, 2007.

securities. Moreover, the efficacy of single-country regulation is being tested in the face of increasing globalization and the ease with which funds can move across national borders. The nearby box considers some of these issues.

The SEC’s Regulation FD (for Fair Disclosure), introduced in 2000, prohibits firms from divulging material information to one outside group (e.g., stock analysts) before making it available to the entire market. In addition, to settle charges concerning their publication of biased stock research as a quid pro quo for IPO allocations and investment banking contracts, major investment banks agreed in late 2002 to fence off stock research from the investment banking side of the firm.

Circuit Breakers

The market collapse of October 19, 1987, prompted several suggestions for regulatory change. Among these was a call for “circuit breakers” to slow or stop trading during periods of extreme volatility. Some of the current circuit breakers still being used entail trading halts. If the Dow Jones Industrial Average falls by 10%, trading will be halted

for 1 hour if the drop occurs before 2:00 p.m. (Eastern Standard Time), for ½ hour if the drop occurs between 2:00 and 2:30, but not at all if the drop occurs after 2:30. If the Dow falls by 20%, trading will be halted for 2 hours if the drop occurs before 1:00 p.m., for 1 hour if the drop occurs between 1:00 and 2:00, and for the rest of the day if the drop occurs after 2:00. A 30% drop in the Dow would close the market for the rest of the day, regardless of the time.

The idea behind circuit breakers is that a temporary halt in trading during periods of very high volatility can help mitigate informational problems that might contribute to excessive price swings. For example, even if a trader is unaware of any specific adverse economic news, if he sees the market plummeting, he will suspect that there might be a good reason for the price drop and will become unwilling to buy shares. In fact, he might decide to sell shares to avoid losses. Thus, feedback from price swings to trading behavior can exacerbate market movements. Circuit breakers give participants a chance to assess market fundamentals while prices are temporarily frozen. In this way, they have a chance to decide whether price movements are warranted while the market is closed.

Of course, circuit breakers have no bearing on trading in non-U.S. markets. It is quite possible that they simply have induced those who engage in program trading to move their operations into foreign exchanges.

Insider Trading

Regulations also prohibit insider trading. It is illegal for anyone to transact in securities to profit from **inside information**, that is, private information held by officers, directors, or major stockholders that has not yet been divulged to the public. But the definition of insiders can be ambiguous. While it is obvious that the chief financial officer of a firm is an insider, it is less clear whether the firm's biggest supplier can be considered an insider. Yet a supplier may deduce the firm's near-term prospects from significant changes in orders. This gives the supplier a unique form of private information, yet the supplier is not technically an insider. These ambiguities plague security analysts, whose job is to uncover as much information as possible concerning the firm's expected prospects. The distinction between legal private information and illegal inside information can be fuzzy.

The SEC requires officers, directors, and major stockholders to report all transactions in their firm's stock. A compendium of insider trades is published monthly in the SEC's *Official Summary of Securities Transactions and Holdings*. The idea is to inform the public of any implicit vote of confidence or no confidence made by insiders.

Insiders *do* exploit their knowledge. Three forms of evidence support this conclusion. First, there have been well-publicized convictions of principals in insider trading schemes.

Second, there is considerable evidence of "leakage" of useful information to some traders before any public announcement of that information. For example, share prices of firms announcing dividend increases (which the market interprets as good news concerning the firm's prospects) commonly increase in value a few days *before* the public announcement of the increase. Clearly, some investors are acting on the good news before it is released to the public. Share prices still rise substantially on the day of the public release of good news, however, indicating that insiders, or their associates, have not fully bid up the price of the stock to the level commensurate with the news.

A third form of evidence on insider trading has to do with returns earned on trades by insiders. Researchers have examined the SEC's summary of insider trading to measure the performance of insiders. In one of the best known of these studies, Jaffee⁵ examined the abnormal return of stocks over the months following purchases or sales by insiders. For months in which insider purchasers of a stock exceeded insider sellers of the stock by three or more, the stock had an abnormal return in the following 8 months of about 5%. Moreover, when insider sellers exceeded insider buyers, the stock tended to perform poorly.

SUMMARY

1. Firms issue securities to raise the capital necessary to finance their investments. Investment bankers market these securities to the public on the primary market. Investment bankers generally act as underwriters who purchase the securities from the firm and resell them to the public at a markup. Before the securities may be sold to the public, the firm must publish an SEC-accepted prospectus that provides information on the firm's prospects.
2. Already-issued securities are traded on the secondary market, that is, on organized stock exchanges; the over-the-counter market; and for large trades, through direct negotiation. Only license holders of exchanges may trade on the exchange. Brokerage firms holding licenses to trade on the exchange sell their services to individuals, charging commissions for executing trades on their behalf.
3. Trading may take place in dealer markets, via electronic communication networks, or in specialist markets. In dealer markets, security dealers post bid and ask prices at which they are willing to trade. Brokers for individuals execute trades at the best available prices. In electronic markets, the existing book of limit orders provides the terms at which trades can be executed. Mutually agreeable offers to buy or sell securities are automatically crossed by the computer system operating the market. In specialist markets, the specialist acts to maintain an orderly market with price continuity. Specialists maintain a limit-order book, but also sell from or buy for their own inventories of stock. Thus, liquidity in specialist markets comes from both the limit-order book and the specialist's inventory.
4. NASDAQ was traditionally a dealer market in which a network of dealers negotiated directly over sales of securities. The NYSE was traditionally a specialist market. In recent years, as ECNs have commanded a greater share of trading activity, both exchanges have increased their commitment to electronic and automated trading. Most trades on NASDAQ today are electronic, and the NYSE has increased its electronic capabilities through an expansion of Direct + as well as its mergers with Archipelago and Euronext.
5. Trading costs include explicit commissions as well as the bid-ask spread. An ongoing controversy among markets concerns overall trading costs including the effect of spreads. The NYSE argues that it is often the cheapest trading venue when quality of execution (including the possibility of price improvement) is recognized.
6. Buying on margin means borrowing money from a broker to buy more securities than can be purchased with one's own money alone. By buying securities on a margin, an investor magnifies both the upside potential and the downside risk. If the equity in a margin account falls below the required maintenance level, the investor will get a margin call from the broker.
7. Short-selling is the practice of selling securities that the seller does not own. The short-seller borrows the securities sold through a broker and may be required to cover the short position at any time on demand. The cash proceeds of a short sale are kept in escrow by the broker, and the

⁵Jeffrey E. Jaffee, "Special Information and Insider Trading," *Journal of Business* 47 (July 1974).

broker usually requires that the short-seller deposit additional cash or securities to serve as margin (collateral) for the short sale.

8. Securities trading is regulated by the Securities and Exchange Commission, by other government agencies, and through self-regulation of the exchanges. Many of the important regulations have to do with full disclosure of relevant information concerning the securities in question. Insider trading rules also prohibit traders from attempting to profit from inside information.

Related Web sites for this chapter are available at www.mhhe.com/bkm

| | | |
|---------------------------------|--------------------------|--------------------|
| primary market | ask price | NASDAQ |
| secondary market | bid–ask spread | stock exchanges |
| initial public offerings (IPOs) | limit order | block transactions |
| underwriters | stop orders | program trade |
| prospectus | over-the-counter (OTC) | margin |
| private placement | market | short sale |
| dealer markets | electronic communication | inside information |
| auction market | networks (ECNs) | |
| bid price | specialist | |

KEY TERMS

1. Call one full-service broker and one discount broker and find out the transaction costs of implementing the following strategies:
 - a. Buying 100 shares of IBM now and selling them 6 months from now.
 - b. Investing an equivalent amount in 6-month at-the-money call options on IBM stock now and selling them 6 months from now.
2. What purpose does the SuperDot system serve on the New York Stock Exchange?
3. Who sets the bid and asked price for a stock traded over the counter? Would you expect the spread to be higher on actively or inactively traded stocks?
4. Suppose you short sell 100 shares of IBM, now selling at \$120 per share.
 - a. What is your maximum possible loss?
 - b. What happens to the maximum loss if you simultaneously place a stop-buy order at \$128?
5. Dée Trader opens a brokerage account and purchases 300 shares of Internet Dreams at \$40 per share. She borrows \$4,000 from her broker to help pay for the purchase. The interest rate on the loan is 8%.
 - a. What is the margin in Dée's account when she first purchases the stock?
 - b. If the share price falls to \$30 per share by the end of the year, what is the remaining margin in her account? If the maintenance margin requirement is 30%, will she receive a margin call?
 - c. What is the rate of return on her investment?
6. Old Economy Traders opened an account to short sell 1,000 shares of Internet Dreams from the previous problem. The initial margin requirement was 50%. (The margin account pays no interest.) A year later, the price of Internet Dreams has risen from \$40 to \$50, and the stock has paid a dividend of \$2 per share.
 - a. What is the remaining margin in the account?
 - b. If the maintenance margin requirement is 30%, will Old Economy receive a margin call?
 - c. What is the rate of return on the investment?
7. Do you think it is possible to replace market-making specialists with a fully automated, computerized trade-matching system?

PROBLEM SETS

Quiz

Problems

8. Consider the following limit-order book of a specialist. The last trade in the stock occurred at a price of \$50.

| Limit Buy Orders | | Limit Sell Orders | |
|------------------|--------|-------------------|--------|
| Price | Shares | Price | Shares |
| \$49.75 | 500 | \$50.25 | 100 |
| 49.50 | 800 | 51.50 | 100 |
| 49.25 | 500 | 54.75 | 300 |
| 49.00 | 200 | 58.25 | 100 |
| 48.50 | 600 | | |

- a. If a market buy order for 100 shares comes in, at what price will it be filled?
- b. At what price would the next market buy order be filled?
- c. If you were the specialist, would you want to increase or decrease your inventory of this stock?
9. You are bullish on Telecom stock. The current market price is \$50 per share, and you have \$5,000 of your own to invest. You borrow an additional \$5,000 from your broker at an interest rate of 8% per year and invest \$10,000 in the stock.
- a. What will be your rate of return if the price of Telecom stock goes up by 10% during the next year? (Ignore the expected dividend.)
- b. How far does the price of Telecom stock have to fall for you to get a margin call if the maintenance margin is 30%? Assume the price fall happens immediately.
10. You are bearish on Telecom and decide to sell short 100 shares at the current market price of \$50 per share.
- a. How much in cash or securities must you put into your brokerage account if the broker's initial margin requirement is 50% of the value of the short position?
- b. How high can the price of the stock go before you get a margin call if the maintenance margin is 30% of the value of the short position?
11. Suppose that Intel currently is selling at \$40 per share. You buy 500 shares using \$15,000 of your own money, borrowing the remainder of the purchase price from your broker. The rate on the margin loan is 8%.
- a. What is the percentage increase in the net worth of your brokerage account if the price of Intel *immediately* changes to: (i) \$44; (ii) \$40; (iii) \$36? What is the relationship between your percentage return and the percentage change in the price of Intel?
- b. If the maintenance margin is 25%, how low can Intel's price fall before you get a margin call?
- c. How would your answer to (b) change if you had financed the initial purchase with only \$10,000 of your own money?
- d. What is the rate of return on your margined position (assuming again that you invest \$15,000 of your own money) if Intel is selling *after 1 year* at: (i) \$44; (ii) \$40; (iii) \$36? What is the relationship between your percentage return and the percentage change in the price of Intel? Assume that Intel pays no dividends.
- e. Continue to assume that a year has passed. How low can Intel's price fall before you get a margin call?
12. Suppose that you sell short 500 shares of Intel, currently selling for \$40 per share, and give your broker \$15,000 to establish your margin account.
- a. If you earn no interest on the funds in your margin account, what will be your rate of return after 1 year if Intel stock is selling at: (i) \$44; (ii) \$40; (iii) \$36? Assume that Intel pays no dividends.
- b. If the maintenance margin is 25%, how high can Intel's price rise before you get a margin call?

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- c. Redo parts (a) and (b), but now assume that Intel also has paid a year-end dividend of \$1 per share. The prices in part (a) should be interpreted as ex-dividend, that is, prices after the dividend has been paid.
13. Here is some price information on Marriott:

| | Bid | Asked |
|----------|-------|-------|
| Marriott | 37.95 | 38.05 |

You have placed a stop-loss order to sell at \$38. What are you telling your broker? Given market prices, will your order be executed?

14. Here is some price information on Fincorp stock. Suppose first that Fincorp trades in a dealer market.

| | Bid | Asked |
|--|-------|-------|
| | 55.25 | 55.50 |

- a. Suppose you have submitted an order to your broker to buy at market. At what price will your trade be executed?
- b. Suppose you have submitted an order to sell at market. At what price will your trade be executed?
- c. Suppose you have submitted a limit order to sell at \$55.62. What will happen?
- d. Suppose you have submitted a limit order to buy at \$55.37. What will happen?
15. Now reconsider Problem 14 assuming that Fincorp sells in an exchange market like the NYSE.
- a. Is there any chance for price improvement in the market orders considered in parts (a) and (b)?
- b. Is there any chance of an immediate trade at \$55.37 for the limit-buy order in part (d)?
16. You've borrowed \$20,000 on margin to buy shares in Disney, which is now selling at \$40 per share. Your account starts at the initial margin requirement of 50%. The maintenance margin is 35%. Two days later, the stock price falls to \$35 per share.
- a. Will you receive a margin call?
- b. How low can the price of Disney shares fall before you receive a margin call?
17. On January 1, you sold short one round lot (that is, 100 shares) of Zenith stock at \$14 per share. On March 1, a dividend of \$2 per share was paid. On April 1, you covered the short sale by buying the stock at a price of \$9 per share. You paid 50 cents per share in commissions for each transaction. What is the value of your account on April 1?

1. FBN, Inc., has just sold 100,000 shares in an initial public offering. The underwriter's explicit fees were \$70,000. The offering price for the shares was \$50, but immediately upon issue, the share price jumped to \$53.
- a. What is your best guess as to the total cost to FBN of the equity issue?
- b. Is the entire cost of the underwriting a source of profit to the underwriters?
2. If you place a stop-loss order to sell 100 shares of stock at \$55 when the current price is \$62, how much will you receive for each share if the price drops to \$50?
- a. \$50.
- b. \$55.
- c. \$54.87.
- d. Cannot tell from the information given.



3. Specialists on the New York Stock Exchange do all of the following *except*:
 - a. Act as dealers for their own accounts.
 - b. Execute limit orders.
 - c. Help provide liquidity to the marketplace.
 - d. Act as odd-lot dealers.

E-Investments

Stock Market Listing Standards

Each exchange sets different criteria that must be satisfied for a stock to be listed there. The NYSE refers to their requirements as "Listing Standards." NASDAQ refers to the requirements as "Listing Qualifications." Listing requirements for these markets can be found at www.nyse.com and www.nasdaq.com. Find the listing requirements for firms with securities traded on each exchange. The NYSE also provides "continued listing standards." What are those requirements? Using the security search engine on either the NYSE or NASDAQ, search for stocks that do not meet the continued listing standards of the NYSE. Which variables would lead to the stock being delisted from the NYSE? What do you think is the likelihood that this stock will continue to be listed on the NYSE?

1. Go to www.mhhe.com/edumarketinsight. Select the Company tab and enter ticker symbol IQW. Click on the Compustat Reports section and find the link for the company's profile. Where is the company's headquarters located? On what exchange does the company's stock primarily trade?
2. Now link to the Corporate Actions section of the Compustat Reports. Briefly summarize what you find out about the company's history with regard to its name and its ticker symbol.
3. Link to the Financial Highlights section of the Compustat Reports. What firm is the primary auditor of Quebecor's financial statements? Is the auditor's opinion qualified in any way?
4. In the S&P Stock Reports section, link to the company's Stock Report. Scroll down to the Business Summary section of the report. What are some of the magazines that Quebecor prints? For which companies does it print advertising inserts or circulars? What catalogs does it print? What firm(s) does Quebecor use as its Transfer Agent and Registrar? (Hint: If you have difficulty finding this, use the search tool on the Adobe menu that looks like a pair of field glasses. You can enter the word "transfer" and it will find the Transfer Agent.)

STANDARD
& POOR'S

SOLUTIONS TO CONCEPT CHECKS

1. Limited time shelf registration was introduced because of its favorable trade-off of saving issue cost against mandated disclosure. Allowing unlimited shelf registration would circumvent "blue sky" laws that ensure proper disclosure as the financial circumstances of the firm change over time.
2.
 - a. Used cars trade in dealer markets (used-car lots or auto dealerships) and in direct search markets when individuals advertise in local newspapers.
 - b. Paintings trade in broker markets when clients commission brokers to buy or sell art for them, in dealer markets at art galleries, and in auction markets.

- c. Rare coins trade mostly in dealer markets in coin shops, but they also trade in auctions and in direct search markets when individuals advertise they want to buy or sell coins.
3. a. You should give your broker a market order. It will be executed immediately and is the cheapest type of order in terms of brokerage fees.
- b. You should give your broker a limit buy order, which will be executed only if the shares can be obtained at a price about 5% below the current price.
- c. You should give your broker a stop-loss order, which will be executed if the share price starts falling. The limit or stop price should be close to the current price to avoid the possibility of large losses.
4. Solving

$$\frac{100P - \$4,000}{100P} = .4$$

yields $P = \$66.67$ per share.

5. The investor will purchase 150 shares, with a rate of return as follows:

| Year-End Change in Price | Year-End Value of Shares | Repayment of Principal and Interest | Investor's Rate of Return |
|--------------------------|--------------------------|-------------------------------------|---------------------------|
| 30% | \$19,500 | \$5,450 | 40.5% |
| No change | 15,000 | 5,450 | - 4.5 |
| -30% | 10,500 | 5,450 | -49.5 |

6. a. Once Dot Bomb stock goes up to \$110, your balance sheet will be:

| Assets | | Liabilities and Owner's Equity | |
|---------|-----------|--------------------------------|-----------|
| Cash | \$100,000 | Short position in Dot Bomb | \$110,000 |
| T-bills | 50,000 | Equity | 40,000 |

- b. Solving

$$\frac{\$150,000 - 1,000P}{1,000P} = .4$$

yields $P = \$107.14$ per share.