Chapter 12: Market Microstructure and Strategies

Recently, much attention has been given to market microstructure, which is the process by which securities such as stocks are traded. For a stock market to function properly, a structure is needed to facilitate the placing of orders, speed the execution of the trades ordered, and provide equal access to information for all investors.

The specific objectives of this chapter are to:
- describe the common types of stock transactions,
- explain how stock transactions are executed,
- explain the role of electronic communication networks (ECNs) in executing transactions,
- describe the regulation of stock transactions, and
- explain how barriers to international stock transactions have been reduced.

Stock Market Transactions

Some of the more common stock market transactions desired by investors are market and limit orders, margin trades, and short sales. Each of these types of transactions is discussed next.

Placing an Order

To place an order to buy or sell a specific stock, an investor contacts a brokerage firm. Brokerage firms serve as financial intermediaries between buyers and sellers of stock in the secondary market. They receive orders from customers and pass the orders on to the exchange through a telecommunications network. The orders are frequently executed a few seconds later. Full-service brokers offer advice to customers on stocks to buy or sell; discount brokers only execute the transactions desired by customers. For a transaction involving 100 shares, a full-service broker may charge a fee of about 4 percent of the transaction amount versus about 1 percent or less for a discount broker. The larger the transaction amount, the lower the percentage charged by many brokers. Some discount brokers charge a fixed price per trade, such as $30 for any trade that is less than 500 shares.

Investors can contact their brokers to determine the prevailing price of a stock. The broker may provide a bid quote if the investor wants to sell a stock or an ask quote if the investor wants to buy a stock. The investor communicates the order to the broker by specifying (1) the name of the stock, (2) whether to buy or sell that stock, (3) the number of shares to be bought or sold, and (4) whether the order is a market or a limit order. A market order to buy or sell a stock means to execute the transaction at the best possible price. A limit order differs from a market order in that a limit is placed on the price at which a stock can be purchased or sold.
Stock Z is currently selling for $55 per share. If an investor places a market order to purchase (or sell) the stock, the transaction will be executed at the prevailing price at the time the transaction takes place. For example, the price may have risen to $55.25 per share or declined to $54.75 by the time the transaction occurs.

Alternatively, the investor could place a limit order to purchase Stock Z only at a price of $54.50 or less. The limit order can be placed for the day only or for a longer period. Other investors who wish to sell Stock Z may place limit orders to sell the stock only if it can be sold for $55.25 or more. The advantage of a limit order is that it may enable an investor to obtain the stock at a lower price. The disadvantage is that there is no guarantee the market price will ever reach the limit price established by the investor.

**Stop-Loss Order** A stop-loss order is a particular type of limit order. The investor specifies a selling price that is below the current market price of the stock. When the stock price drops to the specified level, the stop-loss order becomes a market order. If the stock price does not reach the specified minimum, the stop-loss order will not be executed. Investors generally place stop-loss orders to either protect gains or limit losses.

Paul bought 100 shares of Bostner Corporation one year ago at a price of $50 per share. Today, Bostner stock trades for $60 per share. Paul believes that Bostner stock has additional upside potential and does not want to liquidate his position. Nonetheless, he would like to make sure that he realizes at least a 10 percent gain from the stock transaction. Consequently, he places a stop-loss order with a price of $55. If the stock price drops to $55, the stop-loss order will convert to a market order, and Paul will receive the prevailing market price at that time, which will be about $55. If Paul receives exactly $55, his gain from the transaction would be 100 shares × ($55 − $50) = $500. If the price of Bostner stock keeps increasing, the stop-loss order will never be executed.

**Stop-Buy Order** A stop-buy order is another type of limit order. In this case, the investor specifies a purchase price that is above the current market price. When the stock price rises to the specified level, the stop-buy order becomes a market order. If the stock price does not reach the specified maximum, the stop-buy order will not be executed.

Karen would like to invest in the stock of Quan Company, but only if there is some evidence that stock market participants are demanding that stock. The stock is currently priced at $12. She places a stop-buy order at $14 per share, so if demand for Quan stock is sufficient to push the price to $14, she will purchase the stock. If the price remains below $14, her order will not be executed.

**Placing an Order Online** The mechanics of placing an order have changed substantially in recent years. Now at least 70 Internet brokers accept orders online, provide real-time quotes, and provide access to information about firms. This trend is likely to continue. Individual investors currently maintain at least 10 million online brokerage accounts; about one of every four retail stock transactions is now initiated online. The online brokerage business has taken some business away from the full-service and even discount brokerages, but the traditional brokerage firms have responded by offering some online services. Many firms that previously required investors to phone in their orders now allow investors to transmit their orders online for a lower commission per trade. Some full-service brokers allow their clients online access to information about any stock of interest.
Some of the more popular online brokerage firms include Ameritrade (http://www.tdameritrade.com), Charles Schwab (http://www.schwab.com), and E*Trade (http://www.etrade.com). The typical commission per trade conducted by online brokerage firms is between $5 and $15. Usually, a minimum balance of between $1,000 and $5,000 is required to open an account.

In 2006, some online brokerage services began to offer zero-commission trades. Typically, though, to be charged no commission, investors must maintain a certain amount of funds in their brokerage accounts and the interest rate paid on these funds is usually low. Thus, the brokerage firms can still profit from these no-commission trades because they can use the funds in the accounts to earn a higher return than they pay the investors as interest. Investors who make frequent trades may benefit from very low or zero commissions, but they should still compare the interest rate earned on account balances and other features before selecting an online brokerage service.

### Margin Trading

When investors place an order, they may consider purchasing the stock on margin; in that case, they use cash along with funds borrowed from their broker to make the purchase. The Federal Reserve imposes margin requirements, which represent the minimum proportion of funds that must be covered with cash. This limits the proportion of funds that may be borrowed from the brokerage firm to make the investment. Margin requirements were first imposed in 1934, following a period of volatile market swings, to discourage excessive speculation and ensure greater stability. Currently, at least 50 percent of an investor’s invested funds must be paid in cash. Margin requirements are intended to ensure that investors can cover their position if the value of their investment declines over time. Thus, with margin requirements, a major decline in stock prices is less likely to cause defaults on loans from brokers and therefore will be less damaging to the financial system.

The ability of higher margin requirements to stabilize stock price movements depends on whether the requirements discourage excessive speculation. Although margin requirements have been changed only 22 times in the United States, they have been changed about 100 times in Japan over the past 35 years. A study by Hardouvelis and Peristiani\(^1\) found that the volatility of the Japanese stock market was higher when investors were allowed to borrow a higher percentage of their investment. The authors’ findings suggest that the Federal Reserve might be able to control U.S. stock market volatility by adjusting margin requirements.

To purchase stock on margin, investors must establish an account (called a margin account) with their broker. Their initial deposit of cash is referred to as the initial margin. To meet the requirements imposed by the Federal Reserve, the initial margin must be at least 50 percent of the total investment (although some brokerage firms impose a higher minimum). The brokerage firm can provide financing for the remainder of the stock investment, and the stock serves as collateral. Over time, the market value of the stock will change. Investors are subject to a maintenance margin, which is the minimum proportion of equity that an investor must maintain in the account as a proportion of the market value of the stock. The investor’s equity position represents what the stock is worth to the investor after paying off the loan from the broker. The New York Stock Exchange (NYSE) and Nasdaq have set the minimum maintenance margin at 25 percent, but some brokerage firms require a higher minimum. If the investor’s equity position falls below the maintenance margin, the investor will receive a margin call from the brokerage firm and will have to deposit cash to the account in order to boost the equity.

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Five days ago, Trish purchased 100 shares of Rimax stock at $60 per share from Ohio Brokerage Firm. Thus, the shares were valued at $6,000. Ohio Brokerage required an initial margin of 50 percent. Trish used $3,000 cash as her equity investment and borrowed the remaining $3,000 from Ohio Brokerage to purchase the stock. Ohio Brokerage requires a maintenance margin of 30 percent. Two days later, the price of Rimax stock declined to $50 per share, so the total value of her shares was $5,000. Since Trish still owed the brokerage firm $3,000, her equity position was equal to $2,000 (computed as the market value of the stock minus the $3,000 that is still owed to the broker). The equity position represents 40 percent of the market value of the stock (computed as $2,000/$5,000), which is still above the maintenance margin of 30 percent. Today, the stock price declines to $40 per share, so the market value of the stock is $4,000. Now Trish’s equity position is $1,000 (computed as $4,000 − $3,000). This position represents 25 percent of the market value of the stock (computed as $1,000/$4,000). Now this position is below the 30 percent maintenance margin required by Ohio Brokerage. Consequently, Ohio Brokerage calls Trish and informs her that she must deposit sufficient cash to her account to raise her equity position to at least 30 percent of the market value of the stock.

Impact on Returns

The return on a stock is affected by the proportion of the investment that is from borrowed funds. Over short-term periods, the return on stocks \( R \) purchased on margin can be estimated as follows:

\[
R = \frac{SP - INV - LOAN + D}{INV}
\]

where

- \( SP \) = selling price of stock
- \( INV \) = initial investment by investor, not including borrowed funds
- \( LOAN \) = loan payments on borrowed funds, including both principal and interest
- \( D \) = dividend payments

Consider a stock priced at $40 that pays an annual dividend of $1 per share. An investor purchases the stock on margin, paying $20 per share and borrowing the remainder from the brokerage firm at 10 percent annual interest. If, after one year, the stock is sold at a price of $60 per share, the return on the stock is

\[
R = \frac{\$60 - \$20 - \$22 + \$1}{\$20} = \frac{\$19}{\$20} = 95\%
\]

In this example, the stock return (including the dividend) would have been 52.5 percent if the investor had used only personal funds rather than borrowing funds. This illustrates how the use of borrowed funds can magnify the returns on an investment.

Any losses are also magnified, however, when borrowed funds are used to invest in stocks. Reconsider the previous example and assume that the stock is sold at a price of $30 per share (instead of $60) at the end of the year. If the investor did not use any borrowed funds when purchasing the stock for $40 per share at the beginning of the
year, the return on this investment would be
\[
R = \frac{\$30 - \$40 - \$0 + \$1}{\$40} = -22.5\%
\]

However, if the investor had purchased the stock on margin at the beginning of the year, paying \$20 per share and borrowing the remainder from the brokerage firm at 10 percent annual interest, the return over the year would be
\[
R = \frac{\$30 - \$20 - \$22 + \$1}{\$20} = -55\%
\]

As these examples illustrate, purchasing stock on margin not only increases the potential return from investing in stock but may magnify the potential losses as well.

**Margin Calls** As explained earlier, when an investor’s equity position falls below the maintenance margin, the investor receives a margin call from the broker, which means that the investor will have to provide more collateral (more cash or stocks) or sell the stock. Because of the potential for margin calls, a large volume of margin lending exposes the stock markets to a potential crisis. A major downturn in the market could result in many margin calls, some of which may force investors to sell their stock holdings if they do not have the cash to build their maintenance margin. Such a response results in more sales of stocks, additional downward pressure on stock prices, and additional margin calls. During the stock market crash in October 1987, for example, investors who did not have cash available to respond to margin calls sold their stock, putting additional downward pressure on stock prices.

The volume of margin lending reported by NYSE firms reached a peak of \$278 billion in March 2000 when market conditions were very favorable. As stock market conditions weakened, the volume of margin lending declined. By August 2001, margin lending reported by NYSE member firms had declined to \$165 billion. Nevertheless, the attack on the United States on September 11, 2001, caused an abrupt decline in stock prices, and once again, many investors had to sell their stock because they could not back up their accounts with additional cash. These sales placed additional downward pressure on stock prices.

**Short Selling** In a short sale, investors place an order to sell a stock that they do not own. They sell a stock short (or “short the stock”) when they anticipate that its price will decline. When they sell short, they are essentially borrowing the stock from another investor and will ultimately have to provide that stock back to the investor from whom they borrowed it. The short-sellers borrow the stock through a brokerage firm, which facilitates the process. The investors who own the stock are not affected when their shares are borrowed, and are not even aware that their shares were borrowed.

If the price of the stock declines by the time the short-sellers purchase it in the market (to return to the investor from whom they borrowed), the short-sellers earn the difference between what they initially sold the stock for versus what they paid to obtain the stock. Short-sellers must make payments to the investor from whom the stock was borrowed to cover the dividend payments that the investor would have received if the stock had not been borrowed. The short-seller’s profit is the difference between the original selling price and the price paid for the stock, after subtracting any dividend payments made. The risk of a short sale is that the stock price may increase over time, forcing the short-seller to pay a higher price for the stock than the price at which it was initially sold.
On May 5, the market value of Vizer Company stock was $70 per share. Ed conducted an analysis of Vizer stock and concluded that the price should be much lower. He called his broker and placed an order to sell 100 shares of Vizer stock. Since he did not have shares of Vizer to sell, this transaction was a short sale. Vizer stock does not pay dividends, so Ed did not have to cover dividend payments for the stock that his brokerage firm borrowed and sold for him. The sale of the stock resulted in proceeds of $7,000, which he placed in his account at the brokerage firm. During the next two months, the price of Vizer stock declined. On July 18, Ed placed an order through his brokerage firm to purchase 100 shares of Vizer stock and offset his short position. The market value at the time was $60, so he paid $6,000 for the shares. Thus, Ed earned $1,000 from his short position. This example ignores transaction costs associated with the short sale.

The risk from taking a short position is that the stock’s price may rise instead of decline as expected. If the price had increased after Ed created the short position, his purchase price would have been higher than his selling price. In this case, Ed would have incurred a loss on the short position.
Measuring the Short Position of a Stock

One measure of the degree of short positions is the ratio of the number of shares that are currently sold short divided by the total number of shares outstanding. For many stocks, this measure is between .5 and 2 percent. A relatively high percentage (such as 3 percent) suggests a large amount of short positions in the market, which implies that a relatively large number of investors expect the stock's price to decline.

Some financial publications disclose the level of short sales for stocks with the short interest ratio, which is the number of shares that are currently sold short divided by the average daily trading volume over a recent period. The higher the ratio, the higher the level of short sales. A short interest ratio of 2.0 for a particular stock indicates that the number of shares currently sold short is two times the number of shares traded per day, on average. A short interest ratio of 20 or more reflects an unusually high level of short sales, indicating that many investors believe that the stock price is currently overvalued. Some stocks have had short interest ratios exceeding 100 at a particular point in time.

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The short interest ratio is also measured for the market to determine the level of short sales for the market overall. A high short interest ratio for the market indicates a high level of short selling activity in the market. The largest short positions are periodically disclosed in *The Wall Street Journal*. For each firm for which there is a large short position, the number of shares sold short is disclosed and compared to the corresponding number a month earlier. The change in the overall short position by investors from the previous month is also shown.

**Using a Stop-Buy Order to Offset Short Selling** Investors who have established a short position commonly request a stop-buy order to limit their losses.

A year ago, Mary sold short 200 shares of Patronum Corporation stock for $70 per share. Patronum’s stock currently trades for $80 a share. Consequently, Mary currently has an unrealized loss on the short sale, but she believes that Patronum stock will drop below $70 in the near future. She is unwilling to accept a loss of more than $15 per share on the transaction. Consequently, she places a stop-buy order for 200 shares with a specified purchase price of $85 per share. If Patronum stock increases to $85 per share, the stop-buy order becomes a market order, and Mary will pay approximately $85 per share. If Patronum stock does not increase to $85 per share, the stop-buy order will never be executed.

**How Trades Are Executed**

Transactions on the stock exchanges and the Nasdaq are facilitated by floor brokers, specialists, and market-makers.

**Floor Brokers**

Floor brokers are situated on the floor of a stock exchange. There are hundreds of computer booths along the perimeter of the trading floor, where floor brokers receive orders from brokerage firms. The floor brokers then fulfill and execute those orders.

Bryan Adams calls his broker at Zepellin Securities, where he has a brokerage account, and requests the purchase of 1,000 shares of Clapton, Inc. stock, which is traded on the NYSE. The broker at Zepellin communicates this information to the NYSE trading floor. A floor broker who may be an employee of Zepellin or some other brokerage firm receives the order at a booth and goes to a specific trading post where Clapton stock is traded. There are 20 trading posts on the NYSE, and a different set of stocks is traded at each trading post. The floor broker communicates the desire to purchase 1,000 shares of Clapton stock at a specific price. Other floor brokers who have orders to sell Clapton stock either communicate their willingness to accept the bid or signal the “ask” price at which they would be willing to sell the shares. If the floor brokers can agree on a price, a transaction is executed. The transaction is recorded and transmitted to the tape display. Bryan will likely receive a message from the broker, indicating that the trade was executed, and will receive confirmation in the mail within three days. Bryan provides payment to his brokerage firm within three days.

**Specialists**

Specialists can serve a broker function on stock exchanges by matching up buy and sell orders. They gain from accommodating these orders because their bid and ask prices differ. In addition, they also take positions in specific stocks to which they are assigned.
There are 443 specialists on the NYSE, and each one is typically assigned five to eight stocks. Most of them are employed by one of seven specialist firms. The specialists are required to signal to floor brokers if they have unfilled orders.

Specialists have access to the book (list) of market and limit orders. At the beginning of each day, they set their bid and ask prices to reflect a balance between buy and sell orders. The bid price is the price at which the specialist would purchase the stock; the ask price is the price at which the specialist would sell the stock.

The price of Mackin Company stock closed at $32 last night. After the market closed, Mackin announced that it had been awarded a patent on a new invention. Many investors placed orders to buy the stock after hearing this news. Before the market opened on the following morning, the specialist assessed the buy and sell orders for Mackin stock. At a price of $32, there was an imbalance because the demand for the shares was much larger than the supply of shares for sale. The specialist decided that a proper equilibrium price would be about $33 per share. At that price, the quantity of Mackin shares for sale would be equal to the quantity of shares demanded. That is, the higher price would eliminate a portion of the demand (because some investors would be unwilling to pay that price), thereby allowing supply and demand to be equal. He established a bid price of $33.00 and an ask price of $33.02.

Making a Market

Specialists are required to “make a market” in the stocks that they are assigned. This role is commonly misunderstood. Making a market implies that the specialists stand ready to buy or sell the stocks that they are assigned if no other investors are willing to participate. Making a market does not mean that specialists are offsetting all orders by taking the opposite side of every transaction. In fact, many transactions occur without a specialist’s involvement. Specialists participate in about 10 percent of the value of all shares traded; the other transactions are completed on the exchange without their participation.

Making a market does not mean that specialists must prevent a stock price from falling. A large amount of sell orders and a small amount of buy orders for a particular stock will naturally result in a decline in the stock price. Specialists may buy some shares to partially offset this imbalance between supply and demand, but they are buying the shares at the discounted price that resulted from the imbalance. They may sell some shares to partially offset an imbalance when demand exceeds supply, but they are selling the shares at the higher price that resulted from the imbalance. Thus, although specialists incur risk when they take positions on any given day, they commonly earn substantial profits from their positions on average. Since they have access to the book of limit orders on the buy side and sell side, they are sometimes said to be involved in a poker game in which only they can see everyone’s cards.

Furthermore, specialists can set the spread to reflect their preferences. If they wish to avoid investing in a stock they are assigned at a particular point in time, they can widen the spread so that their bid price is substantially below the ask price. Under these circumstances, there will be a more favorable bid price for the stock than their bid price, and they can simply serve the broker function by matching buy and sell orders.

Suppose that a stock is currently priced at $40, and there are numerous large limit orders to sell at various prices slightly less than $40 and only a few limit orders to buy. Clearly, the sentiment is on the sell side, and the equilibrium price will likely decline. Specialists can use this inside information when they decide whether to accommodate orders.

The specialist for the stock of Closet, Inc. is aware that the equilibrium price is currently $39.99 per share. She notices many limit orders by institutional investors to sell shares of Closet stock at $40 per share. Since she has a
large inventory of Closet stock and is concerned because the limit orders suggest possible downward pressure on the price, she decides to sell a large block of her own shares of Closet stock at $39.99. This trade will take priority over the other orders because it is at a slightly lower price. Consequently, the specialist is able to sell her shares ahead of other investors who want to sell their shares. This act, which is referred to as “front-running” (or “penny-jumping”), may even prevent the orders of other investors from being executed if the price reverses as a result. In this example, the specialist who sold a block of shares at $39.99 could cause downward price momentum. Some of the institutional investors who placed limit orders to sell at $40 may have to revise their orders to specify a new lower price in order to sell their shares. They might have been able to sell their shares at $40 if the specialist had not traded in front of them.

Specialists may counter that the example shows how they “provide price improvement.” In the example, the specialist sold shares at a penny per share less than other investors who were willing to sell their shares. However, the specialist’s trade jumped in front of other potential sellers. Although the specialists may argue that they “make a market” for the security, a counterargument is that the investors make the market and specialists only use it to their advantage. The special priority of the specialists is enforced by a “trade-through rule” established by the Securities and Exchange Commission (SEC) in 1975, which requires that an order for NYSE-listed stocks must be executed on the exchange that offers the best price for the investor. The intention of the rule was to benefit investors, but it has allowed specialists to have priority in trading, which can place investors at a disadvantage.

Many institutional investors would prefer to use automated trading to circumvent the specialists because they believe their orders would be handled faster and more fairly. The NYSE’s Superdot system uses automated trading, and now accounts for more than 10 percent of the trading on the NYSE. The “trade-through rule” allows specialists to intervene in place of the Superdot system or other automated systems (discussed shortly). In the past, the NYSE was slow to respond to the concerns of institutional investors. Given that the specialists own about one-third of the seats on the NYSE and that the NYSE is self-regulated, this is not surprising.

In the 2001–2003 period, the NYSE’s regulatory division frequently ignored specialists’ violations. Finally, the NYSE’s weak self-regulatory efforts and the trading violations prompted the SEC to intervene. In 2004, the SEC investigated several specialist firms for various illegal activities. In addition, the SEC allowed investors to circumvent the trade-through rule. Consequently, trades should occur more quickly, and investors may have a better chance of having their trades executed before the price moves outside the range at which they are willing to buy or sell. They are also more likely to complete their trade without being subjected to front-running by specialists.

**Market-Makers on the Nasdaq** Transactions in the Nasdaq market are facilitated by so-called market-makers, who stand ready to buy specific stocks in response to customer orders made through a telecommunications network. They benefit from the difference (spread) between the bid and ask prices. They also can take positions in stocks. Thus, market-makers serve the Nasdaq market in a manner similar to the specialists on the NYSE and Amex. Some market-makers make a market in a few stocks, while others make a market for many stocks. For each stock that is traded in the Nasdaq market, there are 12 market-makers on average. However, stocks that are more actively traded tend to have a larger number of market-makers.

Market-makers take positions to capitalize on the discrepancy between the prevailing stock price and their own valuation of the stock. When many uninformed
investors take buy or sell positions that push a stock’s price away from its fundamental value, the stock price is distorted as a result of the “noise” caused by the uninformed investors (called “noise traders”). Market-makers may take the opposite position of the uninformed investors and therefore stand to benefit if their expectations are correct.

Brokers make the decision on the route by which an order is executed, meaning that they determine whether the order will be filled by a specific market-maker. The spread quoted for a given stock may vary among market-makers. Therefore, the manner by which the trade is routed by the broker can affect the size of the spread. Some market-makers compensate brokers for orders routed to them. So, while a brokerage firm may charge a customer only $10 for a trade, it may also receive a payment from the market-maker. The market-maker may use a wider spread so that it can offer such a payment to the broker. The point is that some customers may pay only $10 for a buy order to be executed, but the order is executed at a price that is relatively high because the market-maker charged a large spread. Customers should attempt to compare not only the fee brokers charge for a trade, but also the spread quoted by the market-maker selected by the brokerage firm. They do not have direct control over the routing process, but can at least select a broker that uses the type of routing process that they prefer. The market is not sufficiently transparent to monitor the routing process, but technology may soon allow customers to more easily monitor the routing and the quoted spreads.

Some brokers own market-maker firms; for example, Charles Schwab & Co. owns Mayer & Schweitzer. In this case, investors who are told that they will be charged a very small commission may also incur a transaction fee through the market-maker.

Effect of the Spread on Transaction Costs

When investors place an order, they are quoted an ask price, or the price that the broker is asking for that stock. There is also a bid price, or the price at which the broker would purchase the stock. The spread is the difference between the ask price and the bid price and is commonly measured as a percentage of the ask price.

Boletto Company stock is quoted by a broker as bid $39.80, ask $40.00. The bid-ask spread is

\[
\text{Spread} = \frac{\$40.00 - \$39.80}{\$40.00} = 0.5\%
\]

This spread of .5 percent implies that if investors purchased the stock and then immediately sold it back before market prices changed, they would incur a cost of .5 percent of their investment for the round-trip transaction.

The transaction cost due to the spread is separate from the commission charged by the broker. The spread has declined substantially over time due to more efficient methods of executing orders and increased competition from electronic communications networks.

The spread is influenced by the following factors:

\[
\text{Spread} = f(\text{Order Costs, Inventory Costs, Competition, Volume, Risk})
\]

Order Costs

Order costs are the costs of processing orders, including clearing costs and the costs of recording transactions.
**Inventory Costs** Inventory costs include the cost of maintaining an inventory of a particular stock. There is an opportunity cost because the funds could have been used for some other purpose. If interest rates are relatively high, the opportunity cost of holding an inventory should be relatively high. The higher the inventory costs, the larger the spread that will be established to cover these costs.

**Competition** The specialist for a particular stock on the NYSE faces competition from other electronic markets where the stock can be traded. For stocks traded in the Nasdaq market, having multiple market-makers promotes competition. If there are only a few market-makers for a particular stock, there is a greater chance of collusion among them. When there is collusion, the spread will be wider than it would be if the market-makers were competing. Conversely, when more market-makers are competing to sell a particular stock, the spread is likely to be smaller.

**Volume** Stocks that are more liquid have less chance of experiencing an abrupt change in price. Those stocks that have a large trading volume are more liquid because there is a sufficient number of buyers and sellers at any time. This liquidity makes it easier to sell a stock at any point in time and therefore reduces the risk of a sudden decline in the stock’s price.

**Risk** If the firm represented by a stock has relatively risky operations, its stock price is normally more volatile over time. Thus, the specialist or market-maker is subject to more risk from holding an inventory in this type of stock and will set a higher spread as a result.

At a given point in time, the spread can vary among stocks. The specialists or market-makers who make a market for a particular stock are exposed to the risk that the stock’s price could change abruptly in the secondary market and reduce the value of their position in that stock. Thus, any factors that affect this type of risk to a specialist or a market-maker of a stock can affect the spread of that stock at a given point in time.

**Electronic Communication Networks (ECNs)**

Electronic communication networks (ECNs) are automated systems for disclosing and sometimes executing stock trades. They were created in the mid-1990s to publicly display buy and sell orders of stock. They were adapted to facilitate the execution of orders and normally service institutional rather than individual investors. In 1997, the SEC allowed ECNs complete access to orders placed in the Nasdaq market. The SEC requires that any quote provided by a market-maker be made available to all market participants. This eliminated the practice of providing more favorable quotes exclusively to proprietary clients. It also resulted in significantly lower spreads between the bid and ask prices quoted on the Nasdaq. ECNs are appealing to investors because they may allow for more efficient execution of trades. ECNs in aggregate now account for more than 30 percent of the total trading volume on the Nasdaq. They also execute a small proportion of all transactions on the NYSE.

Some ECNs focus on market orders. They receive orders and route them through various networks searching for the best price. Other ECNs receive limit orders and electronically match them up with other orders that are still not fulfilled. Exhibit 12.1 shows an example of an ECN book at a given point in time. The book lists the limit buy orders and limit sell orders that are currently not fulfilled. When a new limit order matches an existing order, the transaction is immediately executed, and the matching order is removed from the book. If the new limit order cannot immediately be matched to an existing order on the ECN book, it is added to the book. An ECN can execute a transaction in an average time of about 2 seconds.
Assume that the ECN book shown in Exhibit 12.1 is the book for a particular stock and that a new limit order is placed to sell 300 shares of that stock at a price of no less than $32.68. This order can be matched by the order to buy 300 shares at a bid price of $32.68. Upon the execution of this trade, the order on the ECN book to buy 300 shares at a bid price of $32.68 is removed. Assume now that a new limit order is placed to purchase 1,400 shares at a price of no more than $32.80. This order is matched up with the order to sell 400 shares at an ask price of $32.78 and the order to sell 1,000 shares at $32.80. Then those orders are removed from the ECN book because they have been fulfilled.

Several ECNs serve the stock market. In 2002, Island, an ECN that facilitates about 20 percent of the total Nasdaq trading volume per day, merged with Instinet, another ECN that commonly facilitates daily stock transactions requested by U.S. financial institutions after the U.S. exchanges are closed. Instinet now executes many transactions for Nasdaq stocks and was acquired by Nasdaq in 2005.

Archipelago, another ECN, was created in 1996 to execute trades of Nasdaq and NYSE stocks electronically. Thus, it commonly competed against the NYSE for orders to trade stocks on the NYSE. Archipelago went public in 2004, and in 2006, it was acquired by the NYSE. The NYSE recognized that its floor trading was not as efficient as an ECN and that it would ultimately need a large ECN to compete in facilitating stock trades. Rather than build a large ECN, it acquired one and thus improved its efficiency in executing orders.

ECNs have historically been subjected to regulation by the National Association of Securities Dealers, which includes the market-makers with which the ECNs compete. Consequently, some ECNs have applied to establish their own stock exchanges so that they will not be regulated by their competitors. Archipelago established the first fully electronic stock exchange through an alliance with the Pacific Stock Exchange, the fourth largest U.S. exchange, which trades more than 2,500 securities issued by firms. The alliance resulted in the creation of the Archipelago Exchange, which allows complete electronic trading of stocks listed on the NYSE, on the Amex, and in the Nasdaq market. This exchange allows all buyers and sellers, including individual investors, brokers, and market-makers, to interact electronically.
Interaction between Direct Access Brokers and ECNs

A **direct access broker** is a trading platform on a computer website that allows investors to trade stocks without the use of a broker. The website itself serves as the broker and interacts with ECNs that can execute the trade. Some of the more popular direct access brokers include Charles Schwab’s CyberTrader (http://www.cybertrader.com), Maximum Financial (http://www.trademf.com), Fire Fly Trading (http://www.fireflytrading.com), and NobleTrading (http://www.nobletrading.com). Each of these websites offers a variety of trading platforms, which range from those that are easier to use and offer less information to those that are more complex but provide more information. A monthly fee is usually charged for access to a trading platform; the fee is higher for platforms that offer more information. To use a direct access broker, investors must meet certain requirements, such as maintaining liquid securities valued at more than $50,000. The advantage of a direct access broker is that investors interested in trading a particular stock can monitor the supply of shares for sale at various prices and the demand for shares at various prices on various ECNs. Thus, the market becomes more transparent because investors can visualize the overall supply and demand conditions at various possible prices. Investors can use this information to determine how stock prices may change in the near future.

The use of direct access brokers and ECNs allows computers to match buyers and sellers without relying on the floor brokers or traders on stock exchanges. The trend is toward a floorless exchange where all trades will be executed in cyberspace, and orders will be submitted and confirmed through automated systems. As this technology is implemented across countries, it may ultimately create a single global floorless exchange where investors can easily trade any security in any country by submitting requests from a personal computer.

Program Trading

A common form of computerized trading is **program trading**, which the NYSE defines as the simultaneous buying and selling of a portfolio of at least 15 different stocks that are in the S&P 500 index and have an aggregate value of more than $1 million. This is a narrow definition, as the term is sometimes used in other contexts. The most common program traders are large securities firms. They conduct the trades for their own accounts or for other institutional investors such as pension funds, mutual funds, and insurance companies. The term *program* refers to the use of computers in what is known as the Designated Order Turnaround (DOT) system at the NYSE, which allows traders to send orders to many trading posts at the exchange.

More than 20 million shares per day are traded as a result of program trading. About 75 percent of these shares are traded on the NYSE, 5 percent are traded on other U.S. markets, and 20 percent are traded on non-U.S. markets. During a typical week, a securities firm may trade hundreds of millions of shares through program trading.

Program trading is commonly used to reduce the susceptibility of a stock portfolio to stock market movements. For example, in one form of program trading, numerous stocks that have become “overpriced” (based on a particular model used to value those stocks) are sold. Program trading can also involve the purchase of numerous stocks that have become “underpriced.”

Program trading can be combined with the trading of stock index futures to create **portfolio insurance**. With this strategy, the investor uses futures or options contracts on a stock index. Thus, a decline in the market would result in a gain on the futures or options position, which can offset the reduced market value of the stock portfolio.

Impact of Program Trading on Stock Volatility

Program trading is often cited as the reason for a decline or rise in the stock market. The underlying reason for a large amount of program trading, however, is that institutional investors...
believe that numerous stocks are over- or undervalued. Although program trading can cause share prices to reach a new equilibrium more rapidly, that does not necessarily imply that it causes more volatility in the stock market. A study by Furbush\textsuperscript{2} examined the relationship between the intensity of program trading and stock price volatility. Furbush assessed five-minute intervals of stock index prices and stock index futures prices during the week of the October 1987 crash. He found that greater declines in stock prices were not systematically associated with more intense program trading.

A study by Roll\textsuperscript{3} compared the magnitude of the October 1987 crash for markets using program trading versus markets in other countries. Roll found that the average share price decline of markets using program trading averaged 21 percent versus a 28 percent decline for other countries. Thus, it does not appear that program trading caused more pronounced losses during the crash.

Some critics have also suggested that program trading instigated the crash. Roll found, however, that many Asian stock markets where program trading did not exist plunged several hours before the opening of the U.S. market on Black Monday (October 19, 1987).

**Collars Applied to Program Trading** Since there is some concern that program trading can cause abrupt stock price movements and therefore cause more market volatility, the NYSE has implemented collars (sometimes referred to as “curbs”), which restrict program trading when the Dow Jones Industrial Average changes by 2 percent from the closing index on the previous trading day. Specifically, when the collars are imposed, program trading that reflects a sell order is allowed only when the last movement in the stock’s price was up (an “uptick”). Program trading that reflects a buy order is allowed only when the last movement in the stock’s price was down (a “downtick”). These restrictions are intended to prevent program trading from adding momentum to the prevailing direction of stock price movements on a day when stock prices have already moved substantially from the previous closing level. The collars allow program trading on days when it will exert price pressure in the opposite direction of the last price movement so that it may have a stabilizing effect on the market.

**Registration of Stock Trading**

Regulation of stock markets is necessary to ensure that investors are treated fairly. Without regulation, there would be more trading abuses that would discourage many investors from participating in the market. Stock trading is regulated by the individual exchanges and by the SEC. The **Securities Act of 1933** and the **Securities Exchange Act of 1934** were enacted to prevent unfair or unethical trading practices on the security exchanges. As a result of the 1934 act, stock exchanges were empowered and expected to discipline individuals or firms that violate regulations imposed by the exchange. The NYSE states that every transaction made at the exchange is under surveillance. The NYSE uses a computerized system to detect unusual trading of any particular stock that is traded on the exchange. It also employs personnel who investigate any abnormal price or trading volume of a particular stock or unusual trading practices of individuals.

In 2002, the NYSE issued a regulation requiring its listed firms to have a majority of independent directors (not employees of the firm) on their respective boards of

directors. This requirement was intended to reduce directors’ potential conflicts of interests so that they will concentrate on ensuring that the firm’s management is focused on maximizing the stock’s value for its shareholders.

Ironically, the NYSE was criticized in 2003 for not abiding by some of the governance guidelines that it was imposing on other firms. In August 2003, the financial media reported that Richard Grasso, chairman of the NYSE, would receive $140 million in deferred compensation. The board members involved in determining Grasso’s compensation were criticized for setting a bad example for the firms listed on the exchange. Grasso’s annual salary and bonus were much higher than the chief executive officers of other firms in the financial services industry were receiving. Many institutional investors were outraged and called for a complete overhaul of the NYSE’s governance guidelines for itself. Grasso resigned in September 2003. One lesson from this incident is that although there is a movement in financial markets to improve corporate governance, some conflicts of interest that adversely affect shareholders are still present.

**Circuit Breakers**

Stock exchanges can impose circuit breakers, which are restrictions on trading when stock prices or a stock index reaches a specified threshold level. The NYSE has experimented with different types of circuit breakers since the stock market crash of October 1987. The prevailing circuit breakers have three threshold levels for a daily change in the Dow Jones Industrial Average from its previous closing price: Level 1 (10 percent), Level 2 (20 percent), and Level 3 (30 percent). If the Level 1 threshold is reached, there is a brief (30- or 60-minute) halt in trading. If the Level 2 threshold is reached, there is a slightly longer (1- to 2-hour) halt in trading. If the Level 3 threshold is reached, the market will close for the day. The Nasdaq market and other regional exchanges impose similar circuit breakers. More information on circuit breakers is available at [http://www.nasdaqtrader.com/trader/help/circuitbreaker.stm](http://www.nasdaqtrader.com/trader/help/circuitbreaker.stm).

**Trading Halts**

Stock exchanges may impose trading halts on particular stocks when they believe market participants need more time to receive and absorb material information that could affect the value of a stock. They have imposed trading halts on stocks that are associated with mergers, earnings reports, lawsuits, and other news. A trading halt does not prevent a stock from experiencing a loss in response to news. Instead, the purpose of the halt is to ensure that the market has complete information before trading on the news. A trading halt may last for just a few minutes, or for several hours, or even for several days. Once the stock exchange believes that the market has complete information, it will allow trading to resume. At that time, the dealers at the stock exchange will quote bid and ask prices, based on their view of what the market demand and supply conditions for the stock will be.

Trading halts are intended to reduce stock price volatility, as the market price is adjusted by market forces in response to news. Thus, the halts can prevent excessive optimism or pessimism about a stock by restricting trading until the news about the firm is completely and widely disseminated to the market. However, some critics believe that the trading halts slow the inevitable adjustment in the stock’s price to the news. In general, research has found that the stock volatility is relatively high after a halt is lifted, but that the volatility subsides over the next few days.

**Securities and Exchange Commission (SEC)**

The Securities Act of 1933 and the Securities Exchange Act of 1934 gave the Securities and Exchange Commission authority to monitor the exchanges and required
listed companies to file a registration statement and financial reports with the SEC and the exchanges. In general, the SEC attempts to protect investors by ensuring full disclosure of pertinent information that could affect the values of securities. In particular, some of the more relevant SEC regulations require the following:

- Firms must publicly disclose all information about themselves that could affect the value of their securities.
- Employees of firms may take positions in their own firm’s securities only during periods when they do not know of inside information that will affect the value of the firm once the information becomes public.
- Participants in security markets who facilitate trades must work in a fair and orderly manner.

The regulations prevent abuses that would give someone an unfair advantage over other investors and therefore could reduce the willingness of investors to invest in security markets. SEC regulations allow all investors to have the same access to public information. The SEC’s focus is on sufficient disclosure rather than on accuracy, as it relies on auditors to certify that the financial statements are accurate.

**Structure of the SEC** The SEC is composed of five commissioners appointed by the president of the United States and confirmed by the Senate. Each commissioner serves a five-year term. The terms are staggered so that each year one commissioner’s term ends and a new appointee is added. The president also selects one of the five commissioners to chair the commission.

The commissioners meet to assess whether existing regulations are successfully preventing abuses and to revise the regulations as needed. Specific staff members of the SEC may be assigned to develop a proposal for a new regulation to prevent a particular abuse that is occurring. When the commission adopts new regulations, they are distributed to the public for feedback before final approval. Some of the more critical proposals are subject to congressional review before final approval.

**Key Divisions of the SEC** The SEC has several important divisions that attempt to ensure a fair and orderly stock market. The Division of Corporate Finance reviews the registration statement filed when a firm goes public, corporate filings for annual and quarterly reports, and proxy statements that involve voting for board members or other corporate issues. The Division of Market Regulation requires the orderly disclosure of securities trades by various organizations that facilitate the trading of securities. The Division of Enforcement assesses possible violations of the SEC’s regulations and can take action against individuals or firms. An investigation can involve the examination of securities data or transactions; the SEC has the power to obtain information from specific individuals by subpoena. When the SEC finds that action is warranted, it may negotiate a settlement with the individuals or firms that are cited for violations, file a case against them in federal court, or even work with law enforcement agencies if the violations involve criminal activity. Such actions are normally intended to prevent the violations from continuing and to discourage other individuals or firms from engaging in illegal securities activities.

**ILLUSTRATION** Near the end of 1991, most stock prices were quoted in eighths, such as $32\frac{1}{8}$ to represent $32.125$. Yet, the bid and ask prices for stocks (even the most liquid stocks) in the Nasdaq market at that time were rarely quoted in “odd-eighths,” such as $\frac{1}{8}$, $\frac{3}{8}$, $\frac{5}{8}$, or $\frac{7}{8}$. Instead, Nasdaq market-makers typically structured bid and ask prices in even-eighths, such as a bid price of $32\frac{7}{8}$ and an ask price of $32\frac{3}{8}$. In this way, the spread on each transaction was always at least...
$.25. This structure was peculiar, especially considering that odd-eighths were sometimes used earlier in the year, allowing a spread on those same stocks of $.125. Within a few months, the spread had doubled. This aroused suspicion that the market-makers had implicitly colluded by agreeing to set wider spreads.

This activity continued until it was publicized in 1996. At that time, the SEC charged that the National Association of Securities Dealers (NASD), which regulates the Nasdaq, had failed to prevent some activities by Nasdaq market-makers that reduced competition. In August 1996, the NASD settled the case by offering to spend $100 million to improve its monitoring of Nasdaq market-makers.

SEC Oversight of Corporate Disclosure In October 2000, the SEC issued Regulation Fair Disclosure (FD), which requires firms to disclose relevant information broadly to investors at the same time. As mentioned in Chapter 11, one of the most important results of Regulation FD is that a firm may no longer provide analysts with information that they could use before the market was aware of the information. Before Regulation FD, some firms would commonly hint to analysts that their earnings would be higher than initially anticipated. Thus, the analysts could advise their preferred clients to purchase the stocks before the price was pushed up by the increased demand for shares by other investors who received the information later.

Since Regulation FD, a firm must announce a change in expected earnings to all investors and other interested parties (such as analysts) at the same time. The firm may disclose the information on its website, through a filing of a document (8-K form) with the SEC, and through a news release. The firm may hold a conference call with analysts after the news is announced, but is expected to include all material information in the announcement. Thus, the conference call will not give analysts an unfair advantage because the key information has already been disclosed. In addition, most firms have now opened up their conference calls to investors, who can listen in by phone or online through a website. Analysts who always relied on their own analytical abilities to develop their recommendations are continuing business as usual, but analysts who relied on what might be considered inside information from firms have had to modify their methods of forming insightful opinions about the firms they cover.

Some analysts suggest that the regulation has caused firms to disclose less information to them and to the public than before. To ensure that they do not violate Regulation FD, some firms may offer less information so that no parties have an unfair advantage. In particular, smaller firms find it expensive to issue a press release every time they have relevant information. The SEC is reviewing Regulation FD and may alter it so that it still allows for a flow of information from firms, while ensuring that investors receive the information at the same time as analysts.

How Barriers to International Stock Trading Have Decreased Although the international trading of stocks has grown over time, until recently it was limited by three barriers: transaction costs, information costs, and exchange rate risk. Now, however, these barriers have been reduced, as explained next.

Reduction in Transaction Costs Most countries have their own stock exchanges, where the stocks of local, publicly held companies are traded. In recent years, countries have consolidated their exchanges,
increasing efficiency and reducing transaction costs. Some European stock exchanges use an extensive cross-listing system (called Eurolist) so that investors in a given European country can easily purchase stocks of companies based in other European countries.

In particular, the stock exchange of Switzerland may serve as a model that will be applied by many other stock exchanges around the world because of its efficiency. The Swiss stock exchange is now fully computerized, so a trading floor is not needed. Orders by investors to buy or sell flow to financial institutions that are certified members of the exchange. These institutions are not necessarily based in Switzerland. The details of the orders, such as the stock’s name, the number of shares to be bought or sold, and the price at which the investor is willing to buy or sell, are fed into a computer system. The system matches buyers and sellers and then sends information confirming the transaction to the financial institution, which then informs the investor that the transaction has been completed.

When there are many more buy orders than sell orders for a given stock, the computer will not be able to accommodate all orders. Some buyers will then increase the price they are willing to pay for the stock. Thus, the price adjusts in response to the demand (buy orders) for the stock and the supply (sell orders) of the stock for sale, as recorded by the computer system. Similar dynamics occur on a trading floor, but the computerized system has documented criteria by which it prioritizes the execution of orders, whereas traders on a trading floor may execute some trades in ways that favor themselves at the expense of investors.

Over time, it is likely that other stock exchanges will adopt similar systems, which resemble the electronic communication networks (ECNs) described earlier. The Brussels stock exchange already has conformed to the computerized system. Furthermore, the Internet will allow investors to use their computers to place orders (through the website of a member of the stock exchange) that will then be executed and confirmed by the computer system back through the Internet to the investor. Thus, all parts of the trading process from the placement of orders to the confirmations that transactions have been executed will be conducted by computers. The ease of placing such orders regardless of the location of the investor and the stock exchange is sure to increase the volume of international stock transactions in the future.

Reduction in Information Costs
Information about foreign stocks is now available on the Internet, enabling investors to make more informed decisions without having to purchase information about these stocks. Consequently, investors should be more comfortable assessing foreign stocks. Differences in accounting rules may still limit the degree to which financial data about foreign companies can be interpreted or compared to data about firms in other countries, but there has been some progress in making accounting standards uniform across countries.

Reduction in Exchange Rate Risk
When investing in a foreign stock denominated in a foreign currency, investors are subject to the possibility that the currency denominating the stock will depreciate against the investor’s currency over time. The potential for a major decline in a stock’s value simply because of a large degree of depreciation is greater for emerging markets, such as Indonesia or Russia, where the local currency can change by 10 percent or more on a single day.

The conversion of many European countries to a single currency (the euro) in 1999 should lead to more stock offerings in Europe by U.S. and European-based firms. Before 1999, a European firm needed a different currency in every European country...
in which it conducted business; therefore, the firm would borrow currency from local banks in each country. Now, the firm can use the euro to finance its operations across several European countries and may be able to obtain all the financing it needs with one stock offering denominated in euros. The firm can then use a portion of the revenue (in euros) to pay dividends to shareholders who have purchased the stock. In addition, European investors based in countries where the euro serves as the local currency can now invest in stocks in other European countries that are denominated in euros without being exposed to exchange rate risk.

**Summary**

- Investors engage in various types of stock transactions. They can place an order by phone or online. They can request that a transaction be executed at the prevailing price or only if the stock price reaches a specified level. They can finance a portion of their stock purchase with borrowed funds as a means of increasing the potential return on their investment. They can also sell stocks short.

- Organized stock exchanges are used to facilitate secondary market transactions. Members of the exchanges trade stock for their own accounts or for their clients. The exchanges are served by floor brokers and specialists, who execute transactions. An over-the-counter exchange also exists, where stock transactions are executed through a telecommunications network.

- Electronic communication networks (ECNs) are automated systems for disclosing and sometimes executing stock trades. They facilitate the execution of orders and normally service institutional rather than individual investors. ECNs can interact with a trading platform on a website (called a direct access broker) that allows investors to trade stocks without the use of a broker.

- Stock markets are regulated to ensure that investors are treated fairly. Stock trading is regulated by the individual exchanges and by the SEC. Many of the regulations are intended to prevent unfair or unethical trading practices on the security exchanges. The stock exchanges and the SEC attempt to prevent the use of inside information by investors.

- As various stock markets have removed their barriers to foreign investors, they have become more globally integrated. Transaction costs, information costs, and exchange rate risk have all been reduced, making it easier for investors to engage in international stock trading.

**Point Counter-Point**

**Is a Specialist or a Market-Maker Needed?**

**Point** Yes. A specialist or a market-maker can make a market by serving as the counterparty on a transaction. Without specialists or market-makers, stock orders might be heavily weighted toward buys or sells, and price movements would be more volatile.

**Counter-Point** No. Specialists and market-makers do not prevent stock prices from declining. A stock that has more selling pressure than buying pressure will experience a decline in price, as it should. The electronic communication networks can serve as the intermediary between buyer and seller.

**Who Is Correct?** Use the Internet to learn more about this issue. Offer your own opinion on this issue.
Questions and Applications

1. Orders Explain the difference between a market order and a limit order.
2. Margins Explain how margin requirements can affect the potential return and risk from investing in a stock. What is the maintenance margin?
3. Short Selling Under what conditions might investors consider short selling a specific stock?
4. Short Selling Describe the short selling process. Explain the short interest ratio.
5. Stock Trading Describe the role of a floor broker and a specialist. Explain how specialists or market-makers may attempt to capitalize on stock price discrepancies.
6. ECNs What are electronic communication networks (ECNs)?
7. Program Trading What is program trading? Briefly describe the conclusions reached by Furbush and by Roll from their studies of the relationship between the intensity of program trading and the magnitude of the declines in stock prices during the stock market crash of 1987.
8. Circuit Breakers Explain how circuit breakers are used to reduce the likelihood of a large stock market crash.
10. Bid-Ask Spread Explain the bid-ask spread situation in the NASDAQ market in 1991. How was it changed as a result of the SEC?

Advanced Questions

11. Reg FD What are the implications of Regulation FD?
12. Stock Exchange Transaction Costs Explain how foreign stock exchanges such as the Swiss stock exchange have reduced transaction costs.
13. Front-Running Describe “front-running.” Explain how front-running may prevent limit orders from investors from being executed.

14. Bid-Ask Spread of Penny Stocks Your friend just told you about a penny stock he purchased, which increased in price from $0.10 to $0.50 per share. You start investigating penny stocks, and after conducting a large amount of research, you find a stock with a quoted price of $0.05. Upon further investigation, you notice that the ask price for the stock is $0.08 and that the bid price is $0.01. Discuss the possible reasons for this wide bid-ask spread.

15. Implications of NYSE Compensation The former chairman of the NYSE, Richard Grasso, resigned in 2003 as a result of institutional outrage over his excessive compensation package. Besides setting a bad example for the firms listed on the NYSE, discuss why institutional investors would be outraged.

Interpreting Financial News

Interpret the following statements made by Wall Street analysts and portfolio managers:

a. “Individual investors who purchase stock on margin might as well go to Vegas.”

b. “During a major stock market downturn, specialists suddenly are not available.”

c. “The trading floor may become extinct due to ECNs.”

Managing in Financial Markets

Focus on Stocks without Analyst Coverage As a portfolio manager, you commonly purchase stocks of firms that you think will generate more favorable earnings than what is expected by the market. You also take short positions in stocks of firms that you think will generate less favorable earnings than what is expected by the market. You focus on stocks of smaller companies that have no analyst coverage. What are the advantages of focusing on these types of firms? What are the disadvantages of focusing on these types of firms?

Problems

1. Buying on Margin Assume that Vogl stock is priced at $50 per share and pays a dividend of $1 per share. An investor purchases the stock on margin, paying $30 per share and borrowing the remainder from the brokerage firm at 10 percent annualized interest. If, after one year, the stock is sold at a price of $60 per share, what is the return to the investor?
2. **Buying on Margin** Assume that Duever stock is priced at $80 per share and pays a dividend of $2 per share. An investor purchases the stock on margin, paying $50 per share and borrowing the remainder from the brokerage firm at 12 percent annualized interest. If, after one year, the stock is sold at a price of $90 per share, what is the return to the investor?

3. **Buying on Margin** Suppose that you buy a stock for $48 by paying $25 and borrowing the remaining $23 from a brokerage firm at 8 percent annualized interest. The stock pays an annual dividend of $0.80 per share, and after one year, you are able to sell it for $65. Calculate your return on the stock. Then, calculate the return on the stock if you had used only personal funds to make the purchase. Repeat the problem assuming that only personal funds are used and that at the end of one year you are able to sell the stock at $40.

4. **Margin** How would the return on a stock be affected by a lower initial investment (and higher loan amount)? Explain the relationship between the proportion of funds borrowed and the return.

### Flow of Funds Exercise

#### Shorting Stocks

Recall that if the economy continues to be strong, Carson Company may need to increase its production capacity by about 50 percent over the next few years to satisfy demand. It would need financing to expand and accommodate the increase in production. Recall that the yield curve is currently upward sloping. Also recall that Carson is concerned about a possible slowing of the economy because of potential Fed actions to reduce inflation. It is also considering issuing stock or bonds to raise funds in the next year.

a. In some cases, a stock’s price is too high or too low because of asymmetric information (information known by the firm but not by investors). How can Carson attempt to minimize asymmetric information?

b. Carson Company is concerned that if it issues stock, its stock price over time could be adversely affected by certain institutional investors that take large short positions in a stock. When this happens, the stock’s price may be undervalued because of the pressure on the price caused by the large short positions. What can Carson do to counter major short positions taken by institutional investors if it really believes that its stock price should be higher? What is the potential risk involved in this strategy?

### Internet/Excel Exercises

1. Go to [http://finance.yahoo.com/](http://finance.yahoo.com/). Insert the ticker symbol of the firm of your choice in the “Get Quotes” section. Review the statistics provided. What is the average daily trading volume (Avg Vol)? What is the market capitalization of the firm? What is its price-earnings ratio (P/E)? What is the amount of dividends (if any) paid, and what is the dividend yield (Div & Yield)?

2. For the same firm, click on “Key Statistics.” What is the firm’s beta? What are its return on assets (ROA) and return on equity (ROE)? What is its short ratio?
This problem requires an understanding of the different methods for valuing stocks.

As a stock portfolio manager, you spend most of your day searching for stocks that appear to be undervalued. In the last few days, you have received information about two stocks that you are assessing—Olympic stock and Kenner stock. Many stock analysts believe that Olympic stock and Kenner stock are undervalued because their price-earnings ratios are lower than the industry average. Olympic, Inc. has a PE ratio of 6, versus an industry PE ratio of 8. Its stock price declined recently in response to an announcement that its quarterly earnings would be lower than expected due to expenses from recent restructuring. The restructuring is expected to improve Olympic’s future performance, but its earnings will take a large onetime hit this quarter.

Kenner Company has a PE ratio of 9, versus a PE ratio of 11 in its industry. Its earnings have been decent in recent years, but it has not kept up with new technology and may lose market share to competitors in the future.

Questions

1. Should you still consider purchasing Olympic stock in light of the analysts’ arguments about why it may be undervalued?

2. Should you still consider purchasing Kenner stock in light of the analysts’ arguments about why it may be undervalued?

3. Some stock analysts have just predicted that the prices of most stocks will fall because interest rates are expected to rise, which would cause investors to use higher required rates of return when valuing stocks. The analysts used this logic to suggest that the present value of future cash flows would decline if interest rates rise. The expected increase in interest rates is due to expectations of a stronger economy, which will result in an increased demand for loanable funds by corporations and individuals. Do you believe that stock prices will decline if the economy strengthens and interest rates rise?