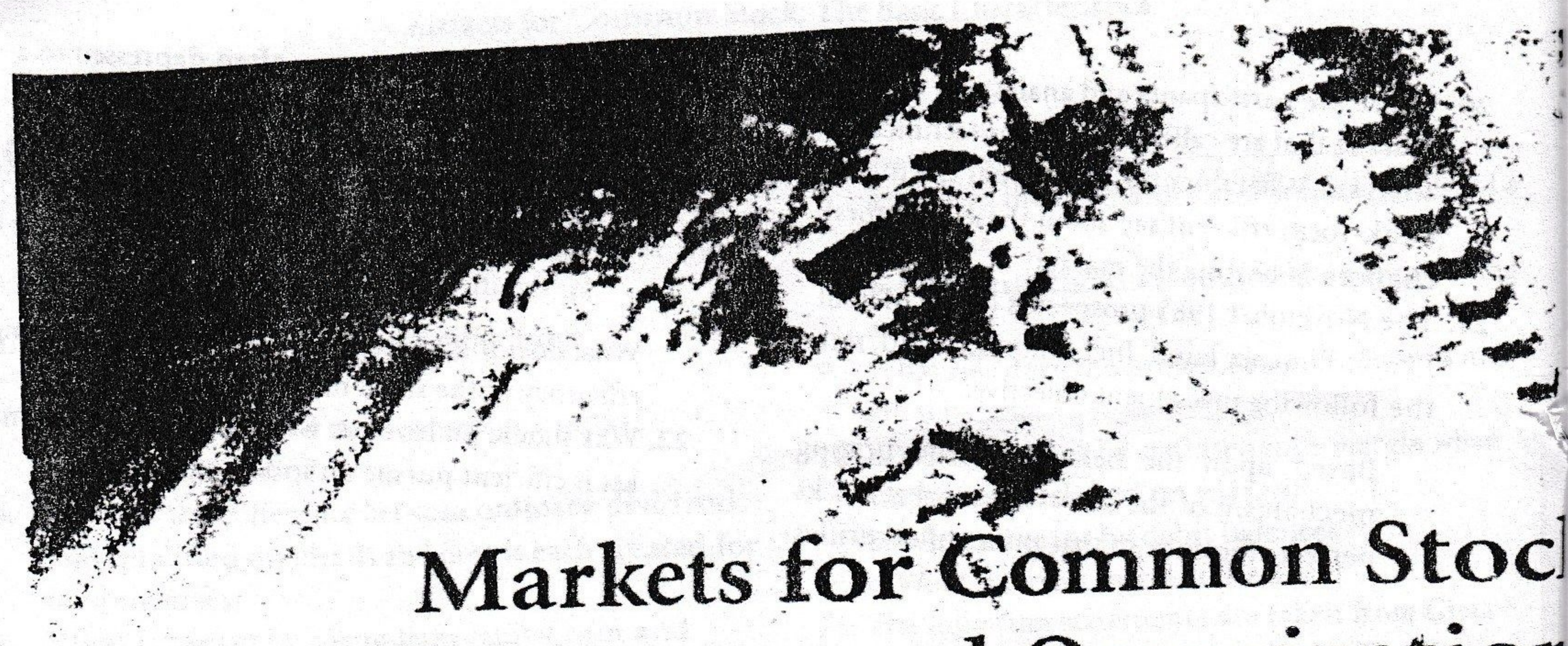


Markets for Common Stock: Structure and Organization*

LEARNING OBJECTIVES

After reading this chapter, you will understand

- the different types of market structure: order-driven, quote-driven, and hybrid
- the natural buyers and natural sellers in a market
- the intermediaries in a quote-driven market
- what is meant by the national best bid and offer and the inside market
- the ownership and trading structure of exchanges
- the national exchanges and their basic features
- for the New York Stock Exchange: the specialist system, the role of the specialist, and the transactors on the exchange floor
- the difference between the New York Stock Exchange and the Nasdaq
- what off-exchange markets (alternative electronic markets) and the two categories of this market (electronic communication networks and alternative trading systems) are
- the different types of alternative trading systems: crossing networks and dark pools
- evolving stock market practices including order handling rules, small order routers, Securities Exchange Commission Regulation National Market Systems, internalization, alternative display facility, trade reporting facility, direct market access, and algorithmic trading

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*A large part of this chapter, including all the tables and figures, draws from Frank J. Jones and Frank J. Fabozzi, "Common Stock Market," Chapter 11 in Frank J. Fabozzi (ed), *Handbook of Finance: Volume I* (Hoboken, NJ: John Wiley & Sons, 2008).

Markets for Common Stock: Structure and Organization

From Chapter 18 of *Foundations of Financial Markets and Institutions*, 4/e. Frank J. Fabozzi. Franco Modigliani. Frank J. Jones.
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At the beginning of the twenty-first century, the world's stock exchanges were a complex of separate, independent, single-product exchanges. During the first part of this century, however, these exchanges have become interconnected within and across country lines and have become multiproduct exchanges. By multiproduct exchanges, we mean that not only is common stock traded on the exchange but other financial instruments such as bonds, options, and futures are also traded. Some of the world's stock exchanges have become international, multiproduct exchanges. The exchanges have and will continue to change rapidly, both diversifying and integrating. In addition to the sanctioned stock exchanges, there are so-called "off-exchange markets" that have become much more important in their size and diversity. The U.S. stock market has become a complex of interconnected exchanges and off-exchange markets.

This chapter offers a snapshot of the current but evolving U.S. stock markets. There are two fundamental differences among U.S. and international exchanges. The first is their method of trading, that is, their **market structure.**[1] The market structures of U.S. and international exchanges have evolved and even changed radically. One cannot appreciate current exchanges without understanding their market structure. The second fundamental difference is that the nature of the exchanges' business organizations have changed considerably, from membership floor-traded organizations to publicly owned electronic trading organizations. Figure 1 summarizes the structure of the mechanisms for equity transactions and

Figure 1 Structure of Equity Transactions

I. *No Intermediary* (All "Naturals")
   - A. Continuous
   - B. Call Auction
     - Provides price discovery, i.e., priced at an internally determined price

II. *Via Intermediaries*
   - A. *Exchanges*
     1. *National*
        - a. NYSE Hybrid—auction (specialist) and electronic (Direct+)
        - b. NYSE-Area
        - c. Nasdaq
        - d. Amex
     2. *Regional*
        - CHX (Chicago)
        - PHLX (Philadelphia)
        - BSE (Boston)
        - National (NSX)
        - Pacific Exchange
   - B. *Off-Exchange Systems: Alternative Electronic Markets*
     1. *Electronic Communication Networks*
     2. *Alternate Trading Systems*
        - a. Crossing Networks
        - b. Dark Pools
        - c. Internalization

[1] For a more detailed discussion of some of the topics covered in this chapter, see Robert A. Schwartz and Reto Francioni, *Equity Markets in Action* (Hoboken, NJ: John Wiley and Sons, 2004).

Table 1 Key Dates

Dates	Events
1969	Instinet formed.
1971	Nasdaq formed, the world's first electronic stock market; began trading on 2/28/1971.
1978	Nasdaq and Amex merged to form the Nasdaq-Amex Group, Inc.
1987	Instinet acquired by Reuters.
12/9/1996	Archipelago founded.
1997	Order Handling Rules approved by SEC.
1997–2000	Proliferation of ECNs.
5/18/2001	Instinet conducts an IPO.
2001	Consolidation of ECNs.
7/2001	LSE IPO (ticker symbol: LSE).
10/20/2001	Archipelago granted exchange status by SEC.
2002	Advent of algorithmic trading.
07/01/2002	Nasdaq IPO (ticker symbol: NDAQ).
9/20/2002	Island acquired by Instinet.
12/06/2002	CME IPO (ticker symbol: CME).
1/2005	Archipelago announced plan to buy the Pacific Stock Exchange.
10/19/2005	CBOT Holdings IPO (ticker symbol: CBOT).
12/2005	Nasdaq buys Instinet Group (and its INET trading platform).
12/15/2005	NYSE launches its Hybrid Market, creating a blend of auction and electronic trading.
12/30/2005	The NYSE, in anticipation of its transformation into a publicly held company, ends member seat sales, which were replaced by the sale of annual trading licenses.
3/7/2006	NYSE buys electronic bourse operator Archipelago Holding (a for-profit, publicly owned company). NYSE Group Inc. formed out of a merger of the New York Stock Exchange and Archipelago Holdings, Inc.
3/8/2006	NYSE Group IPO (ticker symbol: NYX).
4/4/2007	NYSE Group completed merger with Euronext NV, creating the first trans-Atlantic exchange group, called NYSE Euronext.
7/2007	CME merged with CBOT.
7/2007	Reg. NMS implemented.

provides a useful guide for this chapter. Many of the key dates referred to in this chapter are summarized in Table 1.

There are two appendices to this chapter that are available online at www.prenhall.com/fabozzi/. Appendix 18-A describes the current state of the New York Stock Exchange. Appendix 18-B provides a summary of the current state of many of the major non–U.S. exchanges.

EXCHANGE MARKET STRUCTURES

An exchange is often defined as a market where intermediaries meet to deliver and execute customer orders. This description, however, also applies to many dealer networks. In the United States, an exchange is an institution that performs this function and is registered

with the Securities and Exchange Commission (SEC) as an exchange. There are also some off-exchange markets that perform this function.

There are two overall market models for trading stocks. The first model is **order-driven**, in which buy and sell orders of public participants who are the holders of the securities establish the prices at which other public participants can trade. These orders can be either *market orders* or *limit orders*. An order-driven market is also referred to as an **auction market**. The second model is **quote-driven**, in which intermediaries, that is, market-makers or dealers, quote the prices at which the public participants trade. Market-makers provide a **bid quote** (to buy) and an **offer quote** (to sell) and realize revenues from the spread between these two quotes. Thus, market-makers derive a profit from the spread and the turnover of their stocks.

Order-Driven Markets

An order-driven market is also referred to as a **dealer market.** Participants in a *pure order-driven market* are referred to as "naturals" (the natural buyers and sellers). No intermediary participates as a trader in a pure order-driven market. Rather, the investors supply the liquidity themselves. That is, the **natural buyers** are the source of liquidity for the **natural sellers**, and vice versa. The naturals can be either buyers or sellers, each using market or limit orders.

Order-driven markets can be structured in two very different ways: a continuous market or a call auction at any point of time. In the **continuous market**, a trade can be made at any moment in continuous time during which a buy order and a sell order meet. In this case, trading is a series of bilateral matches. In the **call auction**, orders are batched together for a simultaneous execution in a multilateral trade at a specific point in time. At the time of the call, a market-clearing price is determined; buy orders at this price and higher and sell orders at this price and lower are executed.

Continuous trading is better for customers who need immediacy. On the other hand, for markets with very low trading volume, an intraday call may focus liquidity at one (or a few) times of the day and permit the trades to occur. In addition, very large orders—block trades that were described in the previous chapter—may be advantaged by the feasibility of continuous trading.

Non-intermediated markets involve only naturals; that is, such markets do not require a third party. A market may not, however, have sufficient liquidity to function without the participation of intermediaries, who are third parties in addition to the natural buyers and sellers. This leads to the need for intermediaries and quote-driven markets.

Quote-Driven Markets

Quote-driven markets permit intermediaries to provide liquidity. Intermediaries may be *brokers* (who are *agents* for the naturals); *dealers* or *market-makers* (who are *principals* in the trade); and **specialists**, as on the New York Stock Exchange (NYSE) (who act as both agents and principals). Dealers are independent, profit-making participants in the process.

Dealers operate as principals, not agents. Dealers continually provide bids and offer quotes to buy for or sell from their own accounts and profit from the spread between their bid and offer quotes. Dealers compete with each other in their bids and offers. Obviously, from the customer's perspective, the "best" market is the highest bid and lowest offer among the dealers. This highest bid/lowest offer combination is referred to as the "inside market" or the "top of the book." For example, assume that dealers A, B, and C have the bids and offers (also called *asking prices*) for stock Alpha as shown in the top panel in Figure 2.

Figure 2 Quote-Driven Dealer Market for Stock Alpha

a. *Bid-Offer by Three Dealers*

Dealer	Bid	Offer
A	40.50	41.20
B	40.35	41.10
C	40.20	41.00

b. *Top of the Book: Inside Market*

Dealer	Bid	Dealer	Offer
A	40.50	C	41.00
B	40.35	B	41.10
C	40.20	A	41.20

top of the book: ⟵ 40.50/41.00

The best (highest) bid is by dealer A of 40.50; the best (lowest) offer is by dealer C of 41.00. Thus, the inside market is 40.50 bid (by A) and 41.00 offer (by C). Note that A's spread is 40.50 bid and 41.20 offer for a spread (or profit margin) of 0.70. A has the highest bid but not the lowest offer. C has the lowest offer but not the highest bid. B has neither the highest bid nor the lowest offer.

For a stock in the U.S. market, the highest bid and lowest offer across all markets is called the **national best bid and offer (NBBO)**.

Dealers provide value to the transaction process by providing capital for trading and facilitating order handling. With respect to providing capital for trading, they buy and sell for their own accounts at their bid and offer prices, respectively, thereby providing liquidity. With respect to order handling, they provide value in two ways. First, they assist in the price improvement of customer orders; that is, the order is executed within the bid–offer spread. Second, they facilitate the market timing of customer orders to achieve price discovery. Price discovery is a dynamic process that involves customer orders being translated into trades and transaction prices. Because price discovery is not instantaneous, individual participants have an incentive to "market-time" the placement of their orders. Intermediaries may understand the order flow and may assist the customer in this regard. The intermediary may be a person or an electronic system.

The over-the-counter (OTC) markets are quote-driven markets. The OTC markets began during a time when stocks were bought and sold in banks and the physical certificates were passed over the counter.

A customer may choose to buy or sell to a specific market-maker to whom they wish to direct an order. Directing an order to a specific market is referred to as **preferencing**.

Order-Driven versus Quote-Driven Markets

Overall, non-intermediated, order-driven markets may be less costly due to the absence of profit-seeking dealers. But the markets for many stocks are not inherently sufficiently liquid to operate in this way. For this reason, intermediated dealer markets are often necessary for inherently less liquid markets. The dealers provide dealer capital, participate in price discovery, and facilitate market timing, as discussed above.

Because of the different advantages of these two approaches, many equity markets are now **hybrid markets**. For example, the NYSE is primarily a continuous auction order-driven system

based on customer orders, but the specialists enhance the liquidity by their market-making to maintain a fair and orderly market. In addition, the NYSE has other floor traders, call markets at the open and close, and upstairs dealers who provide proprietary capital to facilitate block transactions. Thus, the NYSE is a hybrid combination of these two models. Another hybrid aspect of the NYSE is that it opens and closes trading with a call auction. The continuous market and call auction market are combined. Thus, the NYSE is a continuous market during the trading day and a call auction market to open and close the market and to reopen after a stop in trading. Thus, the NYSE is a hybrid market.

Nasdaq (an acronym for the National Association of Securities Dealers Automated Quotations System), which will be discussed further later in this chapter, began as a descendant of the OTC dealer network, and is a dealer quote-driven market. It remains primarily a quote-driven market, but has added some order-driven aspects such as its limit order book called SuperMontage, discussed below, which made it a hybrid market.

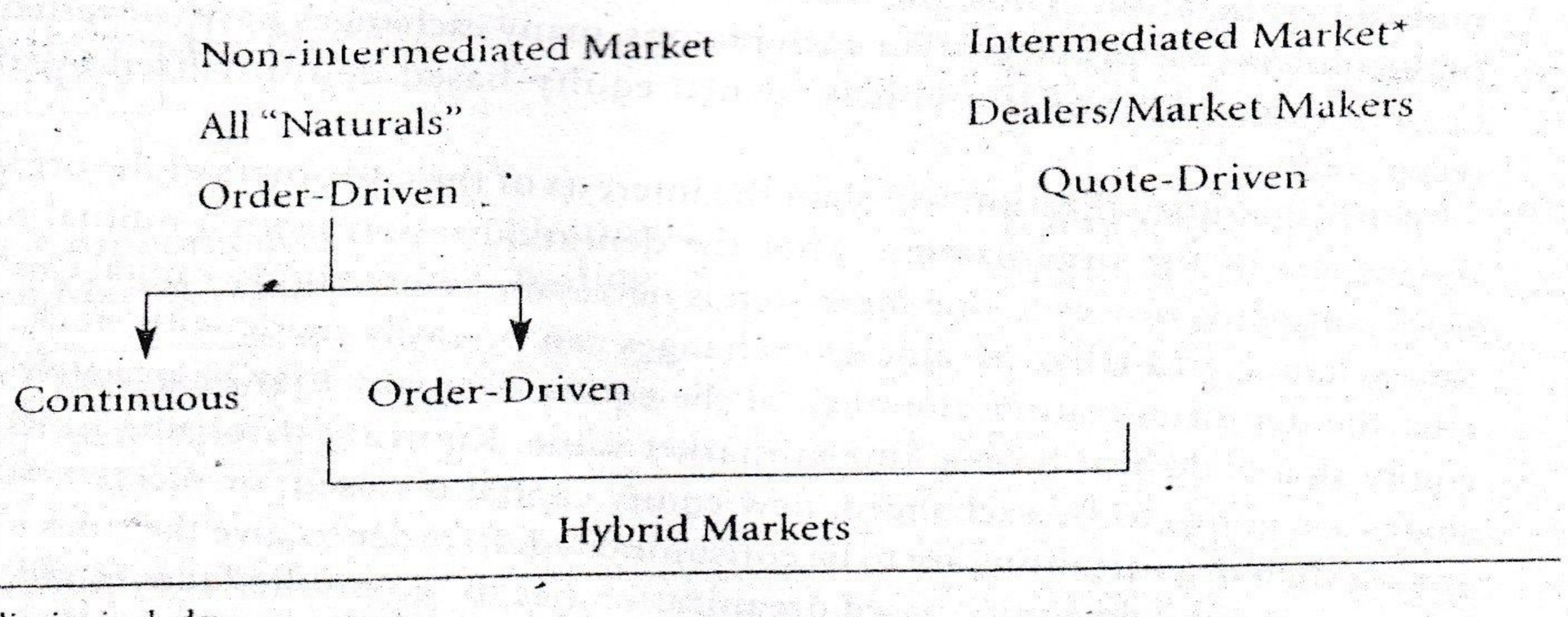
An overview of the non-intermediated, auction, order-driven market and the intermediated, dealer, quote-driven markets is provided in Figure 3.

Another structural change that has occurred in exchanges is their evolution from membership-owned, floor-traded organizations to publicly owned electronically traded (that is, no trading floor) organizations. The nature of this evolution (or revolution) is discussed in the next section.

Key Points That You Should Understand Before Proceeding

1. The difference between an order-driven and quote-driven market.
2. What is meant by the natural buyers and natural sellers in the market.
3. Who the intermediaries are in a quote-driven market.
4. What is meant by the NBBO.
5. What is meant by a hybrid market structure.

Figure 3 Structure of Stock Markets



*Intermediaries include:
- Dealers/Market-Makers (principals)
- Brokers (agents)
- Specialists (operate as both principals and agents)

CHANGES IN EXCHANGE OWNERSHIP AND TRADING STRUCTURES

Exchanges have traditionally been organizations built around a physical trading floor. They have also usually been mutual organizations that are owned and operated on a nonprofit basis for the benefit of their members, those who operate on the trading floor. The ownership by the members is reflected in the memberships or "seats" that provide floor access or trading privileges as well as ownership rights. As the profits derived from these trading privileges increase, the price of the seats increase and the value of the members' equity in their exchange increases. Thus, a membership organization's goal is to increase the value of the access privileges, which increases the price of a seat. A mutual organization's primary objective, thus, is to increase the income of the individual members, not the profit of the overall organization, which is a nonprofit organization.

However, membership organizations may not find it beneficial to themselves to adopt some changes that are beneficial to the customers of the exchange, the buyers and sellers of the exchange's products, because such changes may not be beneficial to the owners of the exchange, the members. For example, adopting a new technology may benefit the customers by reducing the transaction costs but also decrease the value of access privileges and seats of a membership organization. Thus, the members/owners in a membership organization often resist technological innovations, which could benefit customers but reduce the value of their own trading income.

In contrast, a publicly owned equity-based organization is a corporation and operated for a profit. And the profit of the overall organization accrues to its shareholders via an increase in the value of its equity shares. Thus, an equity-based organization might adopt the above-mentioned technology if it benefited its customers, increased its profits, and increased its stock price. The equity-based organization is free of the conflicts of a member organization between trader income and organizational profits.

While an equity-based organization may be superior over time in serving its customers, the difficult issue is convincing the members/owners in a mutual organization to agree to a demutualization and public ownership. The demutualization occurs by giving the members shares or equity in the demutualized organization in exchange for their seats in the mutual organization. Thus, the members would receive wealth/equity shares in exchange for income/access privileges. For such reasons, many exchanges have converted from membership organizations to publicly owned equity-based demutualized organizations in recent years.

Such a demutualization will align the interests of the customers of the organization and the owners of the organization. After the demutualization from a mutual company to a stock company, however, one more step is necessary before equity capital can be raised for the exchange and alliances among exchanges can be easily made with stock. Immediately after the demutualization, the stock of the equity company may be privately held and the equity shares do not have a known market value. Knowing this value is necessary if the shares are going to be exchanged; new equity capital is raised; or mergers or acquisitions among such organizations are to be consummated. In order to give the stock a known market value, the newly equity-based organization has to "go public," that is, sell at least some of its stock on the public markets via an initial public offering (IPO), and then list its shares on a secondary stock market, such as the NYSE or Nasdaq. Once the IPO is complete, the resulting "corporation" knows its overall value ("market value," "market capitalization," or

simply "market cap"), which is its share price multiplied by its number of shares. Corporations can then use their stock to acquire other corporations with their shares. Corporations can also use the value of their corporation as a basis for being acquired by another firm via its stock or cash. Equity or for-profit organizations have the flexibility to raise capital, make acquisitions, and acquire other organizations without resistance from their members, who would be considering their own income.

Overall, before demutualization, the market participants and market owners are the same via memberships, seats, or access privileges. This is ideal for a trading floor organization. The members derive their income from trading on the floor. As a result, floor trading organizations tend to be mutual organizations. After demutualization, the market participants and the market owners are not necessarily the same entities and, thus, may have different objectives, the traders motivated by trading income and the shareholders motivated by organizational (that is corporate) profits. Thus, after the demutualization and the subsequent IPO, a common change is that the corporation can take actions that benefit the corporation itself by providing better service to its customers, even though trader profits may be disadvantaged. The degree of electronic trading increases and trading may become exclusively electronic or remain a mix of floor trading and electronic, often called a hybrid. The owners are shareholders and they do not derive their income from trading on the floor. This sequence of actions is shown in Figure 4.

Traditionally, exchanges of most types have been based on floor trading and the ownership of the exchanges has been with the floor traders, both individuals and firms. Changes in

Figure 4 Evolution of Exchanges

Type of Organization	Trading Mechanism	Ownership
Mutual Company	Floor Trading	Access Privileges via "Seats" or Memberships
↓ Demutualization		
For-Profit Company (Demutualization)	—	Equity Shares of Unknown Value
↓ IPO		
Public Corporation—Known Market Value	Electronic Trading	Equity Shares of Known Market Value
↓ Mergers and Acquisitions		
Large/Multiproduct/ International Corporations		

exchange structure and ownership began in the 1980s. Most notable were the changes that related to the "Big Bang" in London during 1986. These reforms related to the London Stock Exchange (LSE) included the abolition of minimum commissions and the introduction of "dual capacity," whereby member firms could be both brokers (agents) and "jobbers" (the British term for dealers who are principals in a transaction). One outcome of these and other changes was that the LSE's trading floor was closed and replaced by "screen trading," that is, a dealer OTC market. The LSE became a public company in July 2001 (ticker symbol: LSE).

Since then, the major futures exchanges, including the Chicago Mercantile Exchange and the Chicago Board of Trade, have become electronic trading corporations and have merged. The International Securities Exchange, an electronic options exchange, began (in 2000) as a membership-owned exchange; subsequently demutualized; and then did an IPO (in 2005). The NYSE became a publicly owned mainly electronically traded stock exchange. There have been other such transformations.

THE U.S. STOCK MARKETS: EXCHANGES AND OVER-THE-COUNTER MARKETS

The view of the U.S. stock market "from 30,000 feet" is that of a large homogeneous market. But while it has been large, it has not been homogeneous since the 1970s. It has become even much more heterogeneous since the 1990s. The U.S. stock market is now composed of the stock exchanges and OTC markets and also, more recently, the off-exchange markets. This section provides the "big picture" of the current stock market—specific parts of the market are examined more closely in subsequent sections.

The U.S. stock market began over two centuries ago and has evolved considerably since then. The U.S. stock market has traditionally been the core of the world capital markets. Over the past few decades, there have been significant changes in the U.S. stock market and also international stock markets. But undoubtedly, the pace and extent of this change has accelerated.

The stock exchanges have been the primary component of the U.S. stock market. Among the types of changes in the U.S. stock exchanges are

- the market structures of the exchanges
- the trading mechanisms of the exchanges
- consolidation among different types of assets, for example, securities options and futures
- growth and diversity of the off-exchange markets
- consolidation internationally

While the exchanges have been the main component of the U.S. stock market, the OTC markets and the off-exchange markets have also become important parts of the U.S. stock market. The off-exchange markets have also grown and become much more diverse since 2005.

This section covers the exchanges and the OTC markets; the next section considers the off-exchange markets. Given the pace and extent of the recent changes, there is a high likelihood that the markets will be much different during the next decade than they are now.

The international stock exchanges have also changed and, in fact, in some cases, have become integrated with the U.S. exchanges. However, the international stock markets are not considered here except for their relationship with U.S. exchanges.

Figure 5 The "Big Picture" of the U.S. Stock Market

I. Stock Exchanges

A. *National Exchanges*
   1. NYSE Euronext
      a. NYSE Hybrid Market
      b. Archipelago ("Area")
   2. American Stock Exchange

B. *Regional Exchanges*
   1. Chicago Stock Exchange (CHX)
   2. Philadelphia Stock Exchange (PHLX)
   3. Boston Stock Exchange (BSE)
   4. National Stock Exchange (formerly the Cincinnati Stock Exchange) (NSX)
   5. Pacific Stock Exchange (owned by Archipelago; in turn owned by the NYSE)

C. *Nasdaq—the OTC Market* (technically became an exchange during June 2006)
   1. Nasdaq National Market (NNM)
   2. Small Cap Market

D. *Other OTC Markets*
   1. Bulletin Board ("Bullies")
   2. Pink Sheets

E. *Off-Exchange Markets/Alternative Electronic Markets*
   1. Electronic Communication Networks (ECNs)
   2. Alternative Trading Systems (ATS)
      a. Crossing Networks
      b. Dark Pools

Figure 5 provides a general overview, or the "big picture," of the current construct of the U.S. stock markets. The components of the current U.S. stock market are discussed individually in following sections. This section treats the components of the U.S. stock market, including the national exchanges, the NYSE and the American Stock Exchange (Amex); the regional stock exchanges; Nasdaq, technically an OTC market, not an exchange (until June 2006); other OTC markets; and other stock exchange markets.

National Exchanges

The U.S. stock markets are dominated by the NYSE and Nasdaq, the two largest exchanges (as discussed in the following text, until June 2006, Nasdaq was not technically an exchange).

New York Stock Exchange

The beginning of the NYSE is identified as May 17, 1792, when the Buttonwood Agreement was signed by 24 brokers outside of 68 Wall Street in New York under a buttonwood tree. The current NYSE building opened at 18 Broad Street on April 22, 1903 (the "main room"). In 1922, a new trading floor (the "garage") was opened at 11 Broad Street. Additional trading floor space was opened in 1969 and 1988 (the "blue room"). Finally, another trading floor was opened at 30 Broad Street in 2000. Notably, for reasons discussed below, during early 2006, the NYSE closed the trading room at 30 Broad Street with the beginning of the

NYSE Hybrid Market and a greater proportion of the trading being executed electronically. The NYSE is referred to as the "Big Board."

The NYSE trading mechanism has been based on the specialist system. This system, as discussed above, is a hybrid of primarily an order-driven market with some quote-driven features. According to this mechanism, each stock is assigned to an individual specialist. Each specialist "specializes" in many stocks but each stock is assigned to only one specialist. Each specialist is located at a "booth" or "post." All orders for a stock are received at this post and the specialist conducts an auction based on these orders to determine the execution price. The orders arrive at the specialists' posts either physically, delivered via firm brokers, or electronically via the Designated Order Turnaround (DOT) system or its successors, as discussed below. In conducting the auction, typically the specialist is an agent, simply matching orders. At times, however, the specialist becomes a principal and trades for itself in the interest of maintaining an "orderly market."

Limit orders, as opposed to market orders, are kept by the specialist in his or her "book," originally a physical paper book but now an electronic book. These limit orders are executed by the specialist when the market price moves to the limit. Until recently, the book could be seen only by the specialist, which was judged to be a significant advantage for the specialist, but now the book is open to all the traders on the exchange floor. Overall, the NYSE trading mechanism is an auction-based, order-driven market.

This type of mechanism is often judged to provide the best price but, on a time basis, often a less rapid execution. There is, thus, a trade-off between price and speed.

The need for "space" for trading floors for the NYSE derives from its trading mechanism, the floor-based specialist system. The amount of space necessary depends not only on overall trading volume, but also the fraction of this volume that is handled by the specialist.

The NYSE lists stocks throughout the United States (as well as some international stocks) and, thus, is a "national exchange."

Trading Mechanism—The Specialist System Fundamentally, the NYSE is an auction-type market based on orders (order-driven). As indicated above, the traditional trading mechanism for the NYSE is the specialist system. However, the volume of trading that has occurred electronically has increased continually. In 2006, with the advent of NYSE Hybrid, the degree of electronic trading that has occurred electronically increased significantly, as discussed in the following text.

Here, we discuss the traditional NYSE specialist system in more detail. Trading in stocks listed on the NYSE is conducted as a centralized continuous auction market at a designated physical location on the trading floor, called a post, with brokers representing their customers' buy and sell orders. A single specialist is the market-maker for each stock. A member firm may be designated as a specialist for the common stock of more than one company; that is, several stocks can trade at the same post. But only one specialist is designated for the common stock of each listed company.

The NYSE began its DOT system during 1976. This system, now called SuperDOT, is an electronic order routing and reporting system that links member firms worldwide electronically directly to the specialist's post on the trading floor of the NYSE. The NYSE SuperDOT system routes NYSE-listed stock orders electronically directly to a specialist on the exchange trading floor, rather than through a broker. The specialist then executes the orders. This system was initially introduced as the DOT system but is now referred to as the SuperDOT

system. The SuperDOT system is used for small market orders, limit orders, and basket (or portfolio) trades and program trades. The SuperDOT system can be used for under 100,000 shares with priority given to orders of 2,100 shares or less. After the order has been executed, the report of the transaction is sent back through the SuperDOT system. According to the NYSE, as of 2007, over 99% of the orders executed through the NYSE were done through SuperDOT, which meets the continually increasing demand, which stood at 20 million quotes, 50 million orders, and 10 million reports daily.

In addition to the single specialist market-maker on the exchange, other firms that are members of an exchange can trade for themselves or on behalf of their customers. NYSE member firms, which are broker-dealer organizations that serve the investing public, are represented on the trading floor by brokers who serve as fiduciaries in the execution of customer orders.

The largest membership category on the NYSE is that of the **commission broker.** A commission broker is an employee of one of the securities houses (stock brokers or wire houses) devoted to handling business on the exchange. Commission brokers execute orders for their firm on behalf of their customers at agreed commission rates. These houses may deal for their own account as well as on behalf of their clients.

Other transactors on the exchange floor include the following categories. Independent **floor brokers** (nicknamed "$2 brokers") work on the exchange floor and execute orders for other exchange members who have more orders than they can handle alone or who require assistance in carrying out large orders. Floor brokers take a share in the commission received by the firm they are assisting. Registered traders, another category, are individual members who buy and sell for their own account. Alternatively, they may be trustees who maintain memberships for the convenience of dealing and to save fees.

The major type of exchange participant is the specialist.

NYSE Specialist As indicated, specialists are dealers or market-makers assigned by the NYSE to conduct the auction process and maintain an orderly market in one or more designated stocks. Specialists may act as both a broker (agent) and a dealer (principal). In their role as a broker or agent, specialists represent customer orders in their assigned stocks, which arrive at their post electronically or are entrusted to them by a floor broker to be executed if and when a stock reaches a price specified by a customer (limit or stop order). As a dealer or principal, specialists buy and sell shares in their assigned stocks for their own account as necessary to maintain an "orderly market." Specialists must always give precedence to public orders over trading for their own account.

In general, public orders for stocks traded on the NYSE, if they are not sent to the specialist's post via SuperDOT, are sent from the member firm's office to its representative on the exchange floor, who attempts to execute the order in the trading crowd. There are certain types of orders where the order will not be executed immediately on the trading floor. These are limit orders and stop orders. If the order is a limit order or a stop order and the member firm's floor broker cannot transact the order immediately, the floor broker can wait in the trading crowd or give the order to the specialist in the stock, who will enter the order in that specialist's **limit order book** (or simply, the *book*) for later execution based on the relationship between the market price and the price specified in the limit or stop order. The book is the list on which specialists keep the limit and stop orders that are given to them, arranged by size, from near the current market price to further away from it.

Whereas the book used to be an actual physical paper book, it is now electronic. While for many years only the specialist could see the orders in the limit order book, with the NYSE's introduction of OpenBook in January 2002, the book was made available electronically to the traders on the exchange floor.

A significant advantage of the NYSE market is its diversity of participants. At the exchange, public orders meet each other often with minimal dealer intervention, contributing to an efficient mechanism for achieving fair securities prices. The liquidity provided in the NYSE market stems from the active involvement of the following principal groups: the individual investor; the institutional investor; the member firm acting as both agent and dealer; the member-firm broker on the trading floor acting as agent, representing the firm's customer orders; the independent broker on the trading floor acting as agent and handling customer orders on behalf of other member firms; and the specialist, with assigned responsibility in individual securities on the trading floor. Together, these groups provide depth and diversity to the market.

NYSE-assigned specialists have four major roles:

1. As agents, they execute market orders entrusted to them by brokers, as well as orders awaiting a specific market price.
2. As catalysts, they help to bring buyers and sellers together.
3. As dealers, they trade for their own accounts when there is a temporary absence of public buyers or sellers, and only after the public orders in their possession have been satisfied at a specified price.
4. As auctioneers, they quote current bid–ask prices that reflect total supply and demand for each of the stocks assigned to them.

In carrying out their duties, specialists may, as indicated, act as either an agent or a principal. When acting as an agent, the specialists simply fill customer market orders or limit or stop orders (either new orders or orders from their book) by opposite orders (buy or sell). While acting as a principal, the specialists are charged with the responsibility of maintaining a "fair and orderly market." Specialists are prohibited from engaging in transactions in securities in which they are registered unless such transactions are necessary to maintain a fair and orderly market. Specialists profit only from those trades in which they are involved; that is, they realize no revenue for trades in which they are an agent.

The term *fair and orderly market* means a market in which there is price continuity and reasonable depth. Thus, specialists are required to maintain a reasonable spread between bids and offers and small changes in price between transactions. Specialists are expected to bid and offer for their own account if necessary to promote such a fair and orderly market. They cannot put their own interests ahead of public orders and are obliged to trade on their own accounts against the market trend to help maintain liquidity and continuity as the price of a stock goes up or down. They may purchase stock for their investment account only if such purchases are necessary to create a fair and orderly market.

Specialists are also responsible for balancing buy and sell orders at the opening of the trading day in order to arrange an equitable opening price for the stock. Specialists are expected to participate in the opening of the market only to the extent necessary to balance supply and demand for the security to affect a reasonable opening price. While trading throughout the day is via a continuous auction-based system, the opening is conducted via a single-priced call auction system. The specialists conduct the call and determine the single price.

If there is an imbalance between buy and sell orders either at the opening of or during the trading day and the specialists cannot maintain a fair and orderly market, then they may, under restricted conditions, close the market in that stock (that is, discontinue trading) until they are able to determine a price at which there is a balance of buy and sell orders. Such closes of trading can occur either during the trading day or at the opening, which is more common, and can last for minutes or days. Closings of a day or more may occur when, for example, there is an acquisition of one corporation by another or when there is an extreme announcement by the corporation. For this reason, many announcements are made after the close of trading or before the opening of trading.

NYSE trading officials oversee the activities of the specialists and trading-floor brokers. Approval from these officials must be sought for a delay in trading at the opening or to halt trading during the trading day when unusual trading situations or price disparities develop.

Because of their critical public role and the necessity of capital in performing their function as a market-maker, capital requirements are imposed by the exchanges for specialists.

American Stock Exchange

Amex dates from colonial times when brokers conducted outdoor markets to trade new government securities. Amex began trading at the curbstone on Broad Street near Exchange Place. Until 1929, it was called the New York Curb Exchange. In 1921, the Amex moved inside into the building where it still resides at 86 Trinity Place in New York City. In 1998, Amex merged with the National Association of Securities Dealers (NASD), which then operated Nasdaq, to create the Nasdaq-Amex Market Group wherein Amex was an independent member of the NASD parent. After conflicts between the NASD and Amex members, the Amex members bought Amex from NASD and acquired control in 2004. Amex continued to be owned by its members until its acquisition by the NYSE in early 2008.

Amex, like the NYSE, lists stocks from throughout the United States and also international stocks. Amex is therefore a national exchange. Amex is also an auction-type market based on orders. Its specialist system is similar to that of the NYSE.

Amex developed exchange traded funds (ETFs). The first ETF, the SPY ETF, based on the S&P 500 index, was listed on the Amex on January 29, 1993. Although ETFs have proved to be a very successful product and most of the listings remain on the Amex, most of the trading volume has migrated to other exchanges, including the NYSE and Nasdaq.

The number of listings on and the trading volume of stocks on the Amex have continued to decline in recent years, and as of early 2008, the Amex is regarded as a minor market in U.S. stocks, although it continues to trade some small to mid-sized stocks. Amex is now highly dependent on trading in stock options. In January 2008, the NYSE announced an agreement to purchase the Amex. When this transaction is completed, the Amex will most likely no longer exist.

Regional Exchanges

Regional exchanges developed to trade stocks of local firms that listed their shares on the regional exchanges and also to provide alternatives to the national stock exchanges for their listed stocks. Regional stock exchanges now exist in Chicago, Philadelphia, and Boston and have existed in many other U.S. cities. These exchanges have also been specialist-type, auction-based systems. Some of the regional stock exchanges, including Philadelphia and Boston, as well as the Amex have been driven by trading in stock options and index options rather than stocks in recent years.

Chicago Stock Exchange

The Chicago Stock Exchange (CHX) was founded on March 21, 1882. In 1949, it merged with the St. Louis, Cleveland, and Minneapolis/St. Paul Stock Exchanges and changed its name to the Midwest Stock Exchange. In 1993, it changed its name back to the CHX and is the most active regional exchange.

Philadelphia Stock Exchange

The Philadelphia Stock Exchange (PHLX) is the oldest stock exchange in the United States, founded in 1790. In 2005, a number of large financial firms purchased stakes in the PHLX as a hedge against growing consolidation of stock trading by the NYSE and Nasdaq. These firms—Morgan Stanley, Citigroup, Credit Suisse First Boston, UBS AG, Merrill Lynch, and Citadel Investment Group—collectively owned about 45% of the PHLX.

During October 2007, PHLX announced that it was for sale by a group of its shareholders. On November 7, 2007, Nasdaq announced a "definitive agreement" to purchase PHLX for $652 million and the transaction closed in early 2008. PHLX continues to operate as part of Nasdaq.

The PHLX handles trades for approximately 2,000 stocks, 1,700 equity options, 25 index options, and a number of currency options. As of 2007, it had a 14% U.S. market share in exchange-listed stock options trading.

Boston Stock Exchange

The Boston Stock Exchange (BSE) was founded in 1834 and is the third oldest stock exchange in the United States. The Boston C tions Exchange (BCX), a facility of the BSE, is a fully automated options market. On October 2, 2007, Nasdaq agreed to acquire BSE for $61 million.

National Stock Exchange

The National Stock Exchange (NSX), now in Chicago, was founded in 1885 in Cincinnati, Ohio, as the Cincinnati Stock Exchange. In 1976, it closed its physical trading floor and became the first all-electronic stock market in the United States. The Cincinnati Stock Exchange moved its headquarters to Chicago in 1995 and changed its name to the National Stock Exchange during November 2003. The NSX handles a significant share, approximately 20%, of all Nasdaq-listed securities.

Pacific Exchange

The Pacific Exchange (PCX) began in 1957 when the San Francisco Stock and Bond Exchange (founded in 1882 with a trading floor in San Francisco) and the Los Angeles Oil Exchange (founded in 1889 with a trading floor in Los Angeles) merged to form the Pacific Coast Stock Exchange (the trading floors were kept in both places). The name was changed to the Pacific Stock Exchange in 1973 and options trading began in 1976. In 1997, its name was changed to the Pacific Exchange. In 1999, the PCX was the first U.S. stock exchange to demutualize. In 2001, the Los Angeles trading floor was closed, and the next year, the San Francisco trading floor was closed (the options trading floor still operates in San Francisco).

On September 27, 2005, the PCX was bought by the ECN Archipelago, which was in turn bought by the NYSE in 2006. No business is conducted under the name Pacific Exchange, thus ending its separate identity. All formerly PCX stock and options trading takes place through NYSE Arca.

Overall, as indicated by these brief descriptions of regional exchange, some of the regional exchanges have diversified into options trading to remain viable. Some have made the transformation from membership-owned, trading floor organizations to publicly owned electronic organizations, and others have remained in their original forms. Finally, the regional exchanges have become attractive acquisition targets for larger exchanges, with some having already been acquired and others remaining potential merger targets.

Nasdaq Stock Market: The Over-the-Counter Market

A significant change in the U.S. stock market occurred during 1971 when Nasdaq was founded. When it began trading on February 8, 1971, Nasdaq was the world's first electronic stock market. Nasdaq was founded by the NASD. Fundamentally, Nasdaq is a dealer-type system based on quotes (quote-driven).

NASD divested itself of Nasdaq in a series of sales in 2000 and 2001 to form a publicly traded company, the Nasdaq Stock Market, Inc. The Nasdaq Stock Market is a public corporation, the stock of which was listed on its own stock exchange during its IPO on July 1, 2002 (ticker: NDAQ).

Initially, the Nasdaq was simply a computer bulletin board system that did not connect buyers and sellers. The Nasdaq helped lower the spread (the difference between the bid price and the ask price of the stock) and so was unpopular among brokerage firms because they profited on the spread. Since then, the Nasdaq has become more of a stock market, adding automated trading systems and trade and volume reporting.

The Nasdaq, as an electronic exchange, has no physical trading floor, but makes all its trades through a computer and telecommunications system. Since there is no trading floor where the Nasdaq operates, the stock exchange built a site in New York City's Times Square to create a physical presence. The exchange is a dealers' market, meaning brokers buy and sell stocks through a market-maker rather than from each other. A market-maker deals in a particular stock and holds a certain number of stocks on its own books so that when a broker wants to purchase shares, the broker can purchase them directly from the market-maker.

Nasdaq is a dealer system or OTC system where multiple dealers provide quotes (bids and offers) and make trades. There is no specialist system and therefore there is no single place where an auction takes place. Nasdaq is essentially a telecommunication network that links thousands of geographically dispersed, market-making participants. Nasdaq is an electronic quotation system that provides price quotations to market participants on Nasdaq-listed stocks. Nasdaq is essentially an **electronic communication network (ECN)** structure that allows multiple market participants to trade through it. It allows multiple market participants to trade through its ECN structure, increasing competition.

Since Nasdaq dealers provide their quotes independently, the market has been called "fragmented, unlike the NYSE where the central auctions occur at a single place." So while the NYSE market is an auction/agency, order-based market, Nasdaq is a **competitive dealer, quote-based system.**

Until 1987, most trading occurred via telephone. During the October 9, 1987, crash, however, dealers did not respond to telephone calls. As a result, the Nasdaq developed the Small Order Execution System (SOES), which provides an electronic method for dealers to enter their trades. Nasdaq requires that the market-makers honor their trades over SOES.

The purpose of SOES is to ensure that during turbulent market conditions small market orders are not forgotten but are automatically processed.

Over the years, Nasdaq became more of a stock market by adding trade and volume reporting and automated trading systems. In October 2002, Nasdaq started a system, called SuperMontage, which has led to a change in Nasdaq from a quote-driven market to a hybrid market that provides both quote-driven and order-driven aspects; that is, it became a hybrid market. This system permits dealers to enter quotes and orders at multiple prices and then displays these aggregate submissions at five different prices on both the bid and offer sides of the market. SuperMontage also provides full anonymity, permits dealers to specify a reserve size (i.e., they do not have to display their full order), offers price and time priority, allows market-makers to internalize orders, and includes preferenced orders. In effect, SuperMontage is the Nasdaq's order display and execution system.

The advent of SuperMontage continues completing Nasdaq's transformation from a quote-driven market to a hybrid market that contains both quote- and order-driven features. Nasdaq added a third component to the hybrid, which is a call auction that both opens and closes the market. Currently, SuperMontage competes with the **Alternative Display Facility (ADF)**, which is operated by the Financial Industry Regulatory Authority (FINRA). SuperMontage is a key feature in Nasdaq's development.

There are two sections of the Nasdaq stock market, the Nasdaq National Market (NNM) and the Small Cap Market (also known as the Nasdaq Capital Market Issues). For a stock to be listed on the NNM, the company must meet certain strict financial criteria. For example, a company must maintain a stock price of at least $1, and the total value of outstanding stocks must be at least $1.1 million and must meet lower requirements for assets and capital. To qualify for listing on the exchange, a company must be registered with the SEC and have at least three market-makers. However, the Nasdaq also has a market for smaller companies unable to meet these and other requirements, called the Nasdaq Small Caps Market. Nasdaq will move companies from one market to the other as their eligibility changes.

During December 2005, Nasdaq acquired Instinet, the largest ECN and a large trader of Nasdaq-listed stocks.

On June 30, 2006, the SEC approved Nasdaq to begin operating as an exchange in Nasdaq-listed securities. Prior to this, as indicated above, Nasdaq had been an OTC stock market but not formally an exchange. This change is more technical than substantive.

Nasdaq was very acquisitive during 2007. During September 2007, Nasdaq agreed to buy the Middle East's Borse Dubai for approximately $4.9 billion. During August 2007, Nasdaq, after failing to acquire the LSE, partnered with Borse Dubai in the Middle East to gain control of Stockholm's OMX Nordic Exchange, which operates eight Nordic and Baltic exchanges. As part of the deal, Nasdaq sold its 28% position in the LSE to Borse Dubai, which ended up with nearly a 20% stake in Nasdaq, making Borse Dubai the largest stockholder of Nasdaq. This acquisition made the Middle East's Borse Dubai a minority owner of the combined Nasdaq/OMX. With the purchase of OMX following its agreement with Borse Dubai, Nasdaq captured 47% of the controlling stake in OMX. Nasdaq completed its acquisition of OMX in February 2008, becoming a trans-Atlantic exchange. The official name of Nasdaq is now Nasdaq OMX Group Inc.

In October 2007, Nasdaq announced plans to buy the BSE (for $61 million). In November 2007, the Nasdaq Stock Market announced that it would buy the PHLX for approximately $650 million, mainly to trade stock options. This deal, which closed in

August 2008, was Nasdaq's first effort in stock options. Nasdaq, a purely electronic exchange, is expected to maintain the Philadelphia trading floor.

NYSE versus Nasdaq

Fundamentally, the NYSE has been an auction-type market based on orders (order-driven) while Nasdaq has been a dealer-type market based on quotes (quote-driven).

For years and decades, debates continued about which system—the NYSE or Nasdaq system—was more competitive and efficient. Those who think the Nasdaq OTC market is superior to the specialist-based NYSE often cite the greater competition from numerous dealers and the greater amount of capital they bring to the trading system. They also argue that specialists are conflicted in balancing their obligation to conduct a fair and orderly market and their need to make a profit.

Proponents of the specialist NYSE market structure argue that the commitment of the dealers in the OTC market to provide a market for shares is weaker than the obligation of the specialists on the exchanges. On the NYSE, specialists are obligated to maintain fair and orderly markets. Failure to fulfill this obligation may result in a loss of specialist status. A dealer in the OTC market is under no such obligation to continue its market-making activity during volatile and uncertain market conditions. Supporters of the specialist system also assert that without a single location for an auction, the OTC markets are fragmented and do not achieve the best trade price.

Another difference of opinion comes from traders who say that the specialist system may arrive at the better price, but take a longer period of time, during which the market price may move against the trader, or at least expose the trader to the risk that it will do so. The OTC market may, on the other hand, lead to a faster execution but not arrive at a better, market-clearing price. Professional traders, in this case, often prefer higher speed over better pricing. Retail investors on the other hand may prefer a better price.

While the NYSE has been an auction-type, order-driven market, it has adopted many dealer-type features. Similarly, while Nasdaq has been a dealer-type, quote-driven market, it has adopted many auction-type features. Thus, while distinct differences continue between these two markets, they have converged considerably and are both currently hybrid markets, although with different mixes of order-driven and quote-driven features.

In general, the new electronic markets have greater latency (that is, greater speed), making rapid quotes feasible. However, these quotes are not persistent. Such markets also make the business scalable.

Exchange Volume Data

This section illustrates the fragmentation of the trading of the stocks listed on an exchange among different trading markets.

During the 1980s, an exchange actually traded all stocks listed by the exchange and only those stocks. Currently, however, stocks listed on one exchange can be traded by other exchanges, including regional exchanges, by non-exchange markets such as ECN, or via internalization, markets that are discussed below. For example, during the first week of January 2008, based on exchange data, of the 13,222,716 shares of NYSE-listed stocks traded during this week, 41.7% were traded by the NYSE Euronext and 12.3% by NYSE Arca. The remainder were traded by markets not related to the NYSE, including the regional markets, Nasdaq markets, and new stock markets such as the International Securities Exchange and Chicago Board Options Exchange, discussed in the following text.

To generalize this dispersion (or "fragmentation") of trading of an exchange's listed stocks across multiple trading venues on a day in January 2008, according to exchange data consider that of the

- 4,634,118,176 shares of NYSE-listed stocks traded, 39.7% were traded on the NYSE and 12.8% were traded on NYSE Arca, for a total of 52.5% on NYSE affiliated markets
- 2,573,601,692 shares of Nasdaq-listed stocks, 48.4% were traded on Nasdaq
- 1,245,043,387 shares of Amex-listed stocks, only 3.4% were traded on Amex

As indicated in the discussion on Regulation National Market Systems (NMS) later in this chapter, this increase in the fragmentation of trading among venues is likely to continue or even increase due to Regulation NMS.

Other Over-the-Counter Markets

The OTC market is often called a market for "unlisted" stocks. As described previously, there are listing requirements for exchanges. And while, technically, Nasdaq has not been an exchange—it was an OTC market—there are also listing requirements for the NNM and the Small Capitalization OTC markets. Nevertheless, exchange-traded stocks are called "listed," and stocks traded on the OTC markets, including Nasdaq, are called "unlisted."

There are three parts to the OTC market: two under Nasdaq and a third market for truly unlisted stocks, which is therefore a non-Nasdaq OTC market. The non-Nasdaq OTC market is composed of two parts, the OTC Bulletin Board (OTCBB) and the Pink Sheets.

Thus, technically, both exchanges and Nasdaq have listing requirements and only the non-Nasdaq OTC markets are non-listed. However, in common parlance, the exchanges are often called the "listed market," and Nasdaq, by default, is referred to as the "unlisted market." As a result, a more useful and practical categorization of the U.S. stock trading mechanisms is as follows:

1. Exchange-listed stocks
   a. National Exchanges
   b. Regional Exchanges
2. Nasdaq-listed OTC stocks
   a. NNM
   b. Nasdaq Small Cap Market (Capital Market Issues)
3. Non-Nasdaq OTC stocks—unlisted
   a. OTCBB
   b. Pink Sheets

There are two categories of non-Nasdaq stocks. The first is the OTCBB, also called simply the Bulletin Board or Bulletin (often just the "Bullies"). The OTCBB is a regulated electronic quotation service that displays real-time quotes, last sale prices, and volume information in the OTC equity securities. These equity securities are generally securities that are not listed or traded on the Nasdaq or the national stock exchanges. The OTCBB is not part of nor related to the Nasdaq stock market.

The OTCBB provides access to more than 3,300 securities and includes more than 230 participating market-makers. The traded companies do not have any filing or reporting requirements with Nasdaq or FINRA. However, issues of all securities quoted on the

OTCBB are subject to periodic filing requirements with the SEC or other regulatory authorities. Companies quoted on the OTCBB must be fully reporting (i.e., current with all required SEC fillings) but have no market capitalization, minimum share price, corporate governance, or other requirements. Companies that have been "de-listed" from stock exchanges for falling below minimum capitalization, minimum share price, or other requirements often end up being quoted on the OTCBB.

The second non-Nasdaq OTC market is the Pink Sheets. The Pink Sheets is an electronic quotation system that displays quotes from broker dealers for many OTC securities. Market-makers and other brokers who buy and sell OTC securities can use the Pink Sheets to publish their bid and ask quotation prices. The name "Pink Sheets" comes from the color of paper on which the quotes were historically printed prior to the electronic system. They are currently published today by Pink Sheets LLC, a privately owned company. Pink Sheets LLC is neither a NASD broker-dealer nor registered with the SEC; it is also not a stock exchange.

To be quoted in the Pink Sheets companies do not need to fulfill any requirements (e.g., filing statements with the SEC). With the exception of a few foreign issuers (mostly represented by American Depositary Receipts, or ADRs), the companies quoted in the Pink Sheets tend to be closely held, extremely small, and/or thinly traded. Most do not meet the minimum listing requirements for trading on a stock exchange such as the NYSE. Many of these companies do not file periodic reports or audited financial statements with the SEC, making it very difficult for investors to find reliable, unbiased information about those companies.

For these reasons, the SEC views companies listed on Pink Sheets as "among the most risky investments" and advises potential investors to heavily research the companies in which they plan to invest. Buying Pink Sheets stocks is intended to be difficult. Broker-dealers are enjoined to weed out unsophisticated investors who may get an e-mail or word-of-mouth tip about a small stock.

Most OTCBB companies are dually quoted, meaning they are quoted on both the OTCBB and Pink Sheets. Stocks traded on the OTCBB or Pink Sheets are usually thinly traded microcap or penny stocks and are avoided by many investors due to a well-founded fear that share prices are easily manipulated. The SEC issues stern warnings to investors to beware of common fraud and manipulation schemes.

Options Exchanges

In general, options trading is composed of two components: (1) options on individual stocks (stock options), and (2) options an indexes (index options).

Options exchanges are a combination of exchanges of two different origins. The first group began as options exchanges and, as discussed elsewhere, diversified into stock exchanges. They are the Chicago Board Options Exchange (CBOE) and the International Securities Exchange (ISE). The second group consists of stock exchanges that diversified into options exchanges. They are Amex, the PHLX, the BCX (a subsidiary of the BSE and now part of the Montreal Stock Exchange, which became part of the TSX Group), and the NYSE through its Archipelago holding, which had bought the Pacific Stock Exchange, which had added options to its original stock business. With the acquisition of the PHLX, Nasdaq has joined the NYSE as a newcomer in the options market.

A significant difference between stock and options trading is that stock trading is predominantly institutional but stock options trading has a larger retail component, as shown below:

	Institutional	Retail
Stock	85% to 90%	10% to 15%
Options	50%	50%

Other Stock Exchange Markets

Since options exchanges are registered with the SEC, they too can initiate and operate stock exchanges. During 2007, two options exchanges, the ISE and CBOE, began stock exchanges, called the ISE Stock Exchange and the Chicago Board Options Stock Exchange, respectively.

The ISE stock market has two components, the first of which began during September 2006. The first component, called the MidPoint Match, is a non-displayed market or "dark pool" (discussed below), where users can trade in a continuous, anonymous pool in which trades are executed at the midpoint of the NBBO. The second component is a fully displayed continuous and anonymous electronic market wherein quotes are integrated in an auction market. Thus, investors can benefit from the interaction between a non-displayed dark pool, the MidPoint Match, and the displayed liquidity pool. In this combination of systems, orders will have the opportunity for price improvement from the MidPoint Match system; or be executed or be displayed on the market's order book; or be routed out to other exchanges as required by the SEC's Regulation NMS.

Interestingly, the CBOE and ISE were options-only exchanges that subsequently developed stock exchanges. On the other hand, some of the regional stock exchanges, Philadelphia, Boston, and Pacific, later developed options exchanges. In addition, the NYSE is in the stock options business through its purchase of Archipelago, which previously bought the Pacific Stock Exchange. And Nasdaq entered the stock options business through its purchase of the PHLX.

Key Points That You Should Understand Before Proceeding

1. The types of changes that have occurred in the U.S. stock exchanges.
2. The national exchanges and their basic features.
3. The specialist system of the NYSE and the role of the specialist.
4. The transactors on the NYSE floor.
5. The difference between the NYSE and Nasdaq.

OFF-EXCHANGE MARKETS/ALTERNATIVE ELECTRONIC MARKETS

As explained earlier, the national and regional exchanges have continued to evolve and, in particular, have become much more electronically oriented. As of early 2008, however, a large volume of U.S. stock trading is done off any of the regulated stock exchanges. There has been significant growth and innovation in this sector of the U.S. stock markets in recent years. The **off-exchange markets** (also called **alternative electronic markets**) have continued to grow rapidly and become much more diverse.

Innovation in non-exchange (or off-exchange) trading began even before Nasdaq began. For example, Instinet (an acronym for Institutional Network) began trading in 1969

and was essentially the first electronic communication network (ECN) (although, as discussed below, it was not called an ECN until the late 1990s when the SEC introduced the term as part of the development of its order handling rules).

In general, these off-exchange markets are divided into two categories: ECNs and alternative trading systems.

Electronic Communication Networks

ECNs are essentially off-exchange exchanges. They are direct descendants of (and part of) Nasdaq, not the NYSE. ECNs are privately owned broker-dealers that operate as market participants, initially within the Nasdaq system. They display bids and offers; that is, they provide an open display. They provide institutions and market makers with an anonymous way to enter orders. Essentially, an ECN is a limit order book that is widely disseminated and open for continuous trading to subscribers who may enter and access orders displayed on the ECN. ECNs offer transparency, anonymity, automated service, and reduced costs, and are therefore effective for handling small orders. ECNs may also be linked into the Nasdaq marketplace via a quotation representing the ECN's best buy and sell quote. In general, ECNs use the Internet to link buyers and sellers, bypassing brokers and trading floors. ECNs are informationally linked, even though they are distinct businesses. ECNs are subject to some of the best execution responsibilities including the SEC's Regulation NMS, which is discussed later in the text.

Consider the background of ECNs. Instinet, the first ECN, began operating in 1969 before Nasdaq was founded in 1971. Instinet was designed to be a trading system for institutional investors (and hence, the acronym for its name, which stands for "Institutional Network"). Instinet was viewed as an alternative to and competitor of the traditional Nasdaq dealer market. Instinet was intended to be a trading system for institutional investors, which allowed them to meet in an anonymous, disintermediated market.

Instinet seemed very similar to an exchange but was registered with the SEC, not as an exchange, but initially as a broker-dealer and subsequently as an ECN. Instinet took the position that they were just a broker-dealer that operated in the off-exchange ("upstairs") market as does any other broker-dealer that puts trades together for large customers. The only difference according to Instinet was that it operated electronically. This view emphasized the difficulty of distinguishing an exchange from a broker-dealer in a technological environment. The SEC acknowledged this difficulty by using a new category to apply to Instinet, that is, ECN, as discussed below when we explain order handling rules.

The number of ECNs increased considerably after the SEC imposed the order handling rules in 1997. As a result, ECNs significantly affected Nasdaq after 1997. ECNs such as Archipelago, Brut, Island, and Instinet captured a majority of Nasdaq volume in about two years. Instinet acquired Island in September 2002.

Archipelago, which began operating in 1997, handles both institutional and retail order flow. Another ECN, Island, was primarily retail. Prior to these developments, all the off-exchange systems were designed for institutional customers.

As many as a dozen ECNs existed by early 2000. Then, a wave of consolidations and acquisitions began that within only two years reduced that number down to a few. Some of the large ECNs were acquired: Instinet by Nasdaq during December 2005, and Archipelago by the NYSE during March 2006. Prior to its acquisition, Archipelago, an ECN at the time, acquired the Pacific Stock Exchange to form a fully electronic stock exchange.

As of early 2008, there were only a few ECNs operating; the largest is Better Alternative Trading System (BATS), which provides trades to Nasdaq, the NYSE, the ISE, and some regional exchanges. BATS began in January 2006 and applied to the SEC to become a fully licensed securities exchange during 2007. On August 25, 2008, Direct Edge, which had also applied to the SEC to become an exchange, announced that it would take control of the ISE Stock Exchange. This action allowed Direct Edge to operate as an exchange prior to the SEC approval of its own exchange.

Becoming an exchange permits BATS and Direct Edge to send out price quotes to customers more quickly and directly, as discussed in the following text. BATS handles approximately 10% of U.S. equities and Direct Edge handles 5%.

Among the other large ECNs are Bloomberg, LavaFlow, and Track Data.

Prior to 2000, ECNs could not penetrate the NYSE-listed stocks as they did the Nasdaq market. The main reason was the impediment imposed by the NYSE's Rule 390, also called the order consolidation or order concentration rule. According to Rule 390, dealers who traded NYSE-listed stocks in the OTC could not be members of the NYSE. For this reason, only a few dealers actively participated in the OTC market for NYSE-listed stocks and so NYSE-listed stocks were traded mainly on the NYSE.

All central markets have incentives to impose order consolidation rules on their members. However, the SEC, to open up the NYSE market, pressured the NYSE to eliminate Rule 390. The NYSE eliminated Rule 390 in December 1999. This elimination exposed the NYSE to the same type of fragmentation to which Nasdaq had been exposed. But in the years immediately after the elimination of Rule 390, the NYSE continued to conduct most of the trading in its stocks; that is, the NYSE market did not experience nearly as much fragmentation as the Nasdaq markets. Subsequently, however, the NYSE has lost considerable market share to ECNs and other exchanges.

Some of the key events for ECNs are summarized in Figure 6.

Alternative Trading Systems

In addition to ECNs, other **alternative trading systems** (ATS) developed as alternatives to exchanges. It is not necessary in order for two natural parties to conduct a transaction to use an intermediary. That is, the services of a broker or a dealer are not required to execute a trade. The direct trading of stocks between two customers without the use of a broker or an exchange is called an ATS.

A number of proprietary ATSs have been developed. These ATSs are for-profit "broker's brokers" that match investor orders and report trading activity to the marketplace via the Nasdaq or the NYSE. More recently, such trades have been reported through Trade Reporting Facilities, as discussed in the following text. In a sense, ATSs are similar to exchanges because they are designed to allow two participants to meet directly on the system and are maintained by a third party who also serves a limited regulatory function by imposing requirements on each subscriber.

Broadly, there are two types of ATS: (1) crossing networks, which have functioned since the 1980s; and (2) dark pools, which are much more recent.

Crossing Networks

Crossing networks are electronic venues that do not display quotes but anonymously match large orders. Crossing networks are systems developed to allow institutional

Figure 6 ECN Highlights

1969	Instinet (Institutional Network)—first ECN, formed in 1969, before Nasdaq
	• Electronic block-trading system for institutional investors
1997	OHRs (Order-Handling Rules) approved
	• ECNs grew quickly in number
1997	Archipelago formed in December 1996; began trading in 1997; granted exchange status by SEC in October 2001
1997	Island included in the Nasdaq Montage in January 1997
1999	NYSE Rule 390 eliminated
2000	Archipelago, an ECN, bought the Pacific Stock Exchange to form the first fully electronic stock exchange
2001	Instinet went public—IPO was a success
2002	Instinet acquired Island
2005	Instinet acquired by Nasdaq
2006	BATS ECN initiated
2006	Archipelago acquired by NYSE
2008	Only a few ECNs remain, including BATS, Direct Edge, and LavaFlow
2008	BATS ECN becomes a U.S. stock exchange
2008	Direct Edge ECN takes control of ISE Stock Exchange

investors to cross trades—that is, match buyers and sellers directly—typically via computer. These networks are batch processors that aggregate orders for execution at pre-specified times. Crossing networks provide anonymity and reduce costs, and are specifically designed to minimize market impact trading costs. They vary considerably in their approach, including the type of order information that can be entered by the subscriber and the amount of pre-trade transparency that is available to participants.

A crossing network matches buy and sell orders in a multinational trade at a price that is set elsewhere. The price used at the cross can be the midpoint of a bid–ask spread (such as the national bid and offer, as discussed below) or the last transaction price at a major market (such as the NYSE or Nasdaq) or linkage of markets. Thus, no price discovery results from a crossing network.

The major drawbacks of the crossing networks are that (1) their execution rates tend to be low, and (2) if they draw too much order flow away from the main market, they can, to their own detriment, undermine the quality of the very prices on which they are basing their trades. These limitations can be overcome in a call auction environment that includes price discovery.

ATSs began developing during October 1987 when Investment Technologies Group's (ITG) Posit began. Posit is a crossing network that matches customer buy and sell orders that meet or cross each other in price (this is the way crossing networks were named) at a price established by the NYSE or Nasdaq markets or the overall national market.

LiquidNet, a crossing network that started operation in 2001, is an ATS that enables institutional customers to meet anonymously, negotiate a price, and trade in large sizes (average trade size is nearly 50,000 shares). Part of LiquidNet's ability to attract order flow is attributable to its customers being able to negotiate their trades with reference to quotes prevailing in the major market centers. In other words, LiquidNet's customers do not have to participate in

significant price discovery. Further, LiquidNet customers' anonymity and knowledge that counterparties in the system also wish to trade in size offers them some assurance that their orders will not have undue market impact. A key feature of the LiquidNet system is that customer matches are found electronically, and negotiations are also conducted electronically between the natural buyer and seller. LiquidNet has also developed in Europe.

Instinet, in addition to its continuous ECN, also developed an after-hours crossing, the Instinet Crossing Network. Instinet's after-hours cross was the first crossing network.

The Burlington Capital Markets, Burlington Large Order Cross (BLOX) also provides crossing systems. These systems enable institutions to trade with no price impact in a batched environment; the crosses are made at prices set in other stock market places. In addition, Harborside, which started operations in 2002, provides crossing services. These systems assist institutional customers to meet anonymously and negotiate their trades in an anonymous manner in an electronic environment using current quotes from external stock markets as benchmarks.

These crossing systems are designed exclusively for institutional order flow. Among the major current crossing networks and their area of specializations are

- *LiquidNet*: for the buy-side to buy-side only
- *Pipeline*: for buy-side to buy-side block business only
- *ITG Posit*: provides timed crossings five to 10 times per day for buy-side to buy-side only
- *BIDS*: unlike the first three is an agency broker; that is, it does not engage in proprietary trading and, thus, compete with its customers; launched in spring 2007

Crossing networks have provided attractive alternatives to institutions to trade without their orders having any impact on the prices. However, due to lack of liquidity, their execution rates tend to be low and if they draw too much order flow from the established markets, they could undermine the quality of the prices that are the bases for the trades. In effect, crossing networks, which use prices from the central stock markets to price their crosses, are "free riding" on the price discovery of the central markets. These limitations could be resolved in a call auction environment, which does provide price discovery.

In a call auction, sometimes called a period call, orders from customers are batched together for a simultaneous trade at a specific point in time. At the time of the call (in a "timed call"), a market clearing price is determined—that is, there is a price discovery—and buy orders at this price and higher and sell orders at this price and lower are executed.

But the two systems based on call auction methods have not developed liquidity. The two ATSs based on call auction principles were the Arizona Stock Exchange (which started operations in 1991 and has been inactive since 2001) and Optimark (which started in 1999 and has been inactive since 2000). Neither of these systems succeeded in attracting critical mass order flow. Their experiences point up the difficulty of implementing an innovative new trading system that has to compete with an established market center, especially when the new system provides independent price discovery. These call auction systems provided price discovery and, thus, competed with established market centers and had difficulty attracting order flow.

Crossing markets are offered by some of the major broker-dealers, who may also use such systems to "internalize" their order flow—match or cross bids and offers "upstairs"—that is, in their own organization. These orders may both be customer orders or one may be a customer order they cross with their own proprietary orders. Examples of firms involved

in internalization are Citigroup, Credit Suisse, Goldman Sachs, Merrill Lynch, Morgan Stanley, and UBS.

Dark Pools

Another step in the evolution of non-exchange trading is the use of **dark pools.** Dark pools fulfill the need for a neutral gathering place and fulfill the traditional role of an exchange in the new paradigm. Dark pools are private crossing networks in which participants submit orders to cross trades at externally specified prices and, thus, provide anonymous sources of liquidity (hence, the name "dark"). No quotes are involved—only orders at the externally determined price—and, thus, there is no price discovery.

Dark pools are electronic execution systems that do not display quotes but provide transactions at externally provided prices. Both the buyer and seller must submit a willingness to transact at this externally provided price—often the midpoint of the NBBO—to complete a trade. Dark pools are designed to prevent information leakage and offer access to undisclosed liquidity. Unlike open or displayed quotes, dark pools are anonymous and leave no "footprints." The advent of pricing in pennies led to less transparent markets and was, thus, instrumental in the initiation of dark pools.

Dark pools, as well as crossing networks, are creating very fragmented markets for large trades and block trades. Customers also use algorithmic trading (discussed later) to respond to such hidden liquidity.

Among the advantages of dark pools are

- non-displayed liquidity
- prevention of information leakage (anonymous trading)
- volume discovery
- reduced market impact

Among the disadvantages are

- less or no visibility
- difficulty to interact with order flow
- no price discovery

The sponsors of dark pools can be

- exchanges (e.g., NYSE Euronext, the Nasdaq stock market, and the ISE)
- broker-dealers (e.g., Credit Suisse, Morgan Stanley, Goldman Sachs, Merrill Lynch, and others; can be used for brokerage internalization)
- independent organizations (e.g., Instinet, Liquidnet, Pipeline Trading Strategies and ITG Posit)
- consortia of other organizations

Key Points That You Should Understand Before Proceeding

1. What is meant by off-exchange markets (alternative electronic markets).
2. The two categories of off-exchange markets: ECNs and ATSs.
3. How a crossing network operates.
4. How dark pools work.

EVOLVING STOCK MARKET PRACTICES

In this section, we describe evolving stock market practices that include the following:

- order handling rules
- small order routers
- SEC Regulation NMS
- internalization
- ADF
- trade reporting facility
- direct market access
- algorithmic trading

Order Handling Rules

During the 1990s, the SEC continued its emphasis on greater quote and price transparency. In this regard, the SEC instituted new order handling rules in 1997. First, any market-maker who held a customer order had to display that order in their quote. Second, a market-maker could place a more aggressive quote in an ECN, if the ECN displayed the top of its book in the Nasdaq quote montage. Third, if the ECN's own best quote was not shown in the quote montage, then the market-maker had to update its own quote in Nasdaq to match the ECN quote.

While these rules may seem narrow and technical, their effect was significant. They were the basis for ECNs to become major participants in the stock market. Before these rules, Instinet was the only ECN. By 1999, there were nine ECNs.

All a new ECN needed to capture order flow was to be a gateway that attracted some customers to place limit orders on its electronic book. Connectivity with other markets (either directly or through one of Nasdaq's systems) would allow market orders from the customers of other firms to reach its books and become traders. ECNs did not have an impact on NYSE trades until Rule 390 was eliminated in 1999, as discussed above.

The Archipelago ECN began in December 1996. Archipelago stated on its website:

> In January 1997, the U.S Securities and Exchange Commission (SEC) implemented new Order Handling Rules that revolutionized trading in Nasdaq securities. The new rules created the opportunity for Electronic Communications Networks (ECNs), such as the Archipelago ECN, to interact directly with the Nasdaq National Market System. The Archipelago ECN was formed in December 1996 in response to these rules.

The SEC-enforced consolidation, transparency, and accessibility of price information caused by these SEC changes quickly caused the flow of limit orders to fragment onto multiple books and the ECNs' cheap, fast, and anonymous trading forced Nasdaq to alter its trading systems and organizational structure.

Then, with the passage of time, consolidation started taking place among the ECNs. Instinet acquired Island and Archipelago acquired the Pacific Stock Exchange (Archipelago and Instinet/Island accounted for most of the ECN volume). In May 2004, Nasdaq acquired the Brut ECN, previously owned by Sungard Data Systems.

Smart Order Routers

In concept, it might be expected that most of the trading volume of stocks listed on an exchange would be traded directly with the exchange. This has not, however, been the case.

The construct of Nasdaq as a dealer system has made it easy for ECNs and others to conduct the trades directly and report them to the exchange. And since NYSE Rule 390 was removed in 1999, it has been easier to trade NYSE listed stocks off the exchange. This trading of stock listed on an exchange off the exchange is called **fragmentation**. While the fragmentation of the NYSE has increased, the Nasdaq remains much more fragmented than the NYSE.

One of the many results of this fragmentation has been the need by customers for some new systems to provide order management, handling, and routing services. These services select a market often on the basis of recent trading activity, resulting in its user receiving the best executions across the markets by "consolidating" the information across the markets.

One outcome of these smart order routers (also called consolidators) is that customer order flow is "less sticky"; that is, the order flow will switch from one execution service to another quickly based on short-term, quantitative information.

Securities and Exchange Commission Regulation National Market System

The Securities Act amendments of 1975 mandated a U.S. national market system (NMS). The core of this national market was the Intermarket Trading System (ITS), which began operating in 1978. The ITS electronically linked eight markets (NYSE, Amex, Boston, Cincinnati, Chicago, Pacific, and Philadelphia Stock Exchanges, and the NASD OTC market) via ITS computers. The ITS permitted traders at any of these exchanges to go to the best available price at the other exchanges on which the security could trade. The NMS also included a consolidated electronic tape, as discussed elsewhere, which combined the last-sale prices from all the markets onto a single continuous tape. The use of the ITS, however, was voluntary.

Even though ITS evolved, by 2007, it was based on obsolete technology. During 2007, the ITS system was replaced by the new NMS. Regulation NMS was designed by the SEC for electronic exchanges. Regulation NMS requires that orders be executed at the market (exchanges or other execution venues), which offers the best price for the customers. Thus, exchanges must compete with each other on a level playing field. Regulation NMS's impact is attributable to two of its component rules.

The first rule is the Order Protection Rule (Trade-Through Rule). This rule requires that trades be executed at the best displayed prices provided by an electronic trading system and accessible under one second. This means that markets will have to "route out" their orders to other markets if the other markets have a better price (bids or offers). That is, a market cannot "trade through" a better price from another market and trade on their own market instead. As a result of NMS, each exchange has to send its orders to other exchanges if the other exchange has a better price.

The Trade-Through Rule provides price protection to top-of-book orders (best bids or best offers) placed on exchanges that are electronically accessible. Reserve and hidden orders are not protected. Only electronic quotes are protected. All exchanges are required to have capabilities to route orders to the market with the best bid or offer if they are not able to match the price to execute an order on their own exchange. Only the NBBO (or top-of-book) is displayed. In this environment, competitive pricing and low-latency systems are essential in attracting order flow.

The second rule is the Access Rule, which requires the use of private linkages among exchanges to facilitate access to quotes and sets a limit on the access fees by the markets. These private linkages replaced the ITS.

Exchanges had to go to electronic trading to offer protection under Regulation NMS. ECNs and broker-dealers are also covered by Regulation NMS.

A common view is that Regulation NMS will fundamentally change U.S. stock trading by creating a virtual centralized market in which all exchanges will be automated and interconnected. The NMS is expected to divert orders from the two major exchanges, NYSE Euronext and Nasdaq, to the regional exchanges and ECNs. Some regional exchanges view Regulation NMS as a great equalizer. The reason for this position is that the goal is that all investors will get the best price when transacting stocks, regardless of which exchange posts these prices.

Internalization

Internalization refers to off-exchange ("upstairs") trades, mainly of retail trades. As opposed to block trading, internalization involves keeping retail orders within the firm ("internalized") with the broker-dealer buying from its sell orders and selling from its buy orders, generally at the published best bid/offer or a penny better. This practice results in proprietary trading revenue for the broker-dealer. A broker-dealer with a large number of customer orders thereby has a trading opportunity to make a "dealer spread" (buying at the bid and selling at the offer) without interference and will lay off any unwanted positions in the primary market. Brokerage firms internalize through proprietary ATSs. Some believe that this practice reduces transparency, impairs price discovery, and harms investors.

The equity markets permit broker-dealers to internalize retail order flow upstairs. The trades are reported on the trade reporting facility (TRE), as discussed in the following text. While the SEC has approved such internalization in the stock markets, in the stock options markets, the orders must be shown to the public market before internalizing them upstairs. Internalization is, thus, treated differently in the stock and stock options markets.

Off-exchange (internalized) trades as of the end of 2007 account for about 30% of volume in Nasdaq's listed stocks and 16% of the consolidated volume in listed NYSE stocks. Brokers that internalize are reporting 500,000 trades a day in the Nasdaq world and about 350,000 trades a day in NYSE-listed stocks. This volume comes from broker-dealers interacting with their customers' order flow in their upstairs environment and then printing those trades on Nasdaq, as discussed next.[2]

The NYSE is opposed to internalization. It believes that orders are best represented when they interact with the broader marketplace.

Alternative Display Facility

An ADF is an entity independent of a registered securities exchange that collects and disseminates securities quotes and trades. It is a display-only facility. The ADF is an alternative to exchanges for publishing quotations and for comparing and reporting trades. This differs from a trading facility with execution capabilities (a stock exchange) in that the exchange would simply send back to the owner of the displayed order a notice of execution. The NASD operated an ADF since July 2002. It is now operated by FINRA.

The ADF provides members with a facility for the display of quotations, the reporting of trades, and the comparison of trades. As of March 2007, CTA-listed securities (NYSE,

[2] Ivy Schmerken, "Stock Exchanges Create Trade Reporting Facilities to Earn Market Data Fees From Internalized Trades," *Wall Street and Technology* (January 5, 2007).

Amex, and the regional exchanges), as well as Nasdaq-listed securities, are eligible for posting quotations through the ADF. ADF best bid and offer and trade reports are included in the consolidated data stream for CTA and Nasdaq-listed securities.

The ADF competes with Nasdaq's SuperMontage system. These organizations exist to capture some of the values of this information (which has been historically captured by exchanges) for the ADF's information suppliers, usually ECNs.

Trade Reporting Facility

As previously indicated, in the stock market trades can be internalized or arranged upstairs, that is, not traded on an exchange. But if they are traded via internalization, they are not reported on the exchange on which the stock is listed. Traditionally, NASD has had a TRF on which these off-exchange trades are printed—NASD's ADF. So, for example, if Merrill Lynch internalized a trade, it would be printed on NASDs TRF through its ADF.

Until recently, broker-dealers that internalized trades—as well as crossing networks and ECNs that matched trades among their subscribers—had to report these trades to their regulator, the NASD via the Nasdaq's Automated Confirmation Transaction System, known as ACT.

The SEC issued an order on June 30, 2006, approving Nasdaq to begin operating as an exchange in Nasdaq-listed securities. The order included approval of the TRF, a new limited liability company operated by Nasdaq and subject to NASD's oversight. In the wake of Nasdaq receiving SEC approval to become a national stock exchange, NASD and Nasdaq separated, and the SEC allowed Nasdaq to keep its TRF, but also opened this up to competition, thereby ending Nasdaq's and NASD's monopoly. Nasdaq's TRF went live August 1, 2006, the same day that it began operating as an exchange in Nasdaq-listed stocks. With the consolidation of the regulatory functions of NASD and NYSE, FINRA has taken over the reporting function. However, FINRA keeps the tape revenue. For this reason, exchanges can set up their own TRFs, report these trades, and keep some of the tape revenues.

The National Exchange (NSX) (the former Cincinnati Stock Exchange) has set up a TRF, so currently such trades can be reported through this exchange as well as the Nasdaq.

The NYSE integrated with the NASD to create a TRF, serving customers reporting off-exchange trades in all listed NMS stocks. Thus, stock brokers that internalize trades in NYSE-listed stocks would be able to report those trades to a jointly operated NYSE/NASD TRF. These trades are reported by NYSE's TRF as ADF(NYSE). The TRF for NYSE-listed stocks began in 2007.

While the NYSE remains opposed to the internalization of trades, the exchange is developing a TRF for competitive reasons. The NYSE believes that retail orders for individual investors are best represented when they interact with the broader marketplace.[3]

Regional exchanges, including the PHLX, the Boston Equity Exchange (BeX), and the CHX, are also proceeding with plans to create TRFs.

As of early 2008, approximately 30% of total stock volume was reported through a TRF.

Direct Market Access

In general, buy-side firms continued to take more control over the way their transactions were executed. **Direct market access (DMA)** refers to the use of electronic systems to access

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[3] Schmerken, "Stock Exchanges Create Trade Reporting Facilities to Earn Market Data Fees From Internalized Trades."

various liquidity pools and execution venues directly, without the intervention of a sell-side firm trading desk or broker. There are several advantages of DMA to a buy-side firm:

- DMA is faster, allowing traders to benefit from short-term market opportunities.
- DMA has lower transactions costs.
- DMA provides anonymous transactions.
- DMA is not handled by brokers, so there is less chance for error.

With respect to cost, it is estimated that DMA commissions are about one cent per share; program trades are two cents per share; and block trades cost four to five cents per share. Hedge funds are aggressive users of DMA.[4]

Initially, the providers of DMA electronic services were independent firms. But increasingly, traditional sell-side firms have either acquired the independent firms or developed their own DMA systems to provide DMA services to sell-side firms. Among the major providers of this type are Goldman Sachs, Morgan Stanley, CSFB, Citigroup (which acquired Lava), and Bank of New York. Initially, DMA was used only for U.S. equities, but this focus has expanded to U.S. fixed-income and derivatives and into the international markets, Europe and the Asia/Pacific.

DMA has become commoditized and its providers now often provide a comprehensive set of services including program trading, block trading, and also the more sophisticated technique, algorithmic trading, which is discussed in the next section.

Algorithmic Trading

Traditionally, orders for stock executions have been conducted by traders who execute the trades on a trading desk for a portfolio manager or whomever determines what trades should be executed. Traders are judged to have "market information and savy," which permits them to conduct the trades at a lower cost and with less market impact than the portfolio manager conducting the trades on a less formal basis themselves.

The effectiveness of these traders is often measured by execution evaluation services and traders are often compensated partially on the basis of their effectiveness. But some observers believe that the traders, in the interest of maximizing their compensation, may have different incentives than the portfolio managers and do not optimize the portfolio manager's objectives—this is referred to as an agency effect. In addition, some think that trades could be conducted more efficiently by electronic systems than by human traders.

As a result, due to improved technology and quantitative techniques, and also regulatory changes, electronic trading systems have been developed to supplement or replace human traders and their trading desks. Such trading is called **algorithmic trading** or "algo." Algorithmic trading is a relatively recent type of trading technique whereby an overall trade (either buy or sell) is conducted electronically in a series of small transactions instead of one large transaction. Such trades are conducted via computers that make the decision to trade or not trade depending on whether recent price movements indicate whether the market will be receptive to the intended trade at the moment or, on the other hand, will cause the price to move significantly against the intended price. Algorithmic trading also permits the traders to hide their intentions. Trading may involve small trades on a continuous basis

[4] Ivy Schmerken, "Direct-Market-Access Trading," *Wall Street and Technology* (February 4, 2005).

rather than a large trade at a point in time. The algo is often said to leave no "footprint" and is a "soft touch" way of trading.

Algos, like dark pools, provide anonymity, which the "visible markets," like exchanges and ECNs, do not. Algos are often described as "hiding in plain view."

The advent and wide use of algos is due primarily to both technology and regulation. The technology element is based on faster and cheaper technological systems to execute via improved quantitative methods. The regulatory element is the adoption of pennies and the approval of the order handling rules, which provided for the growth of ECNs by the SEC. The adoption of "pennies," which provides for smaller pricing increments, and technological advancements which provide for low-latency trading have made algorithmic trading more necessary and feasible (low latency refers to a short period of time to execute an instruction, that is, high speed).

One important result of pennies in conjunction with algorithmic trading has been that the average trade size has been decreased significantly, again increasing the requirements for reporting and systems. There has been a significant reduction of the average trade size at the NYSE beginning in 2001. Order size on the NYSE declined significantly from over 2,000 shares in 1998 to slightly over 330 in 2007. The use of algorithmic trading is significant by large traders such as hedge funds and mutual funds. Some traders maintain their own algorithmic trading facilities and others use the systems provided by another organization. Overall, algorithmic trading has the advantages of being scalable, anonymous, transparent, and very fast.

SUMMARY

During the 1980s and 1990s, competition among equity transactions providers changed considerably and became much more intense. In the 1980s, the competition for equity transactions was mainly among the NYSE, the Amex, the regional exchanges, and Nasdaq. Gradually, the Amex and the regional exchanges lost ground and the competition became mainly between the two largest exchanges, the NYSE versus Nasdaq. This competition was significantly based on very different market structures: the order-driven, specialist, floor-based mechanism of the NYSE on the one hand; and the quote-driven, dealer-based, electronic mechanism of Nasdaq on the other. Debates on the merits of these competing market structures flourished. The advantage of the specialist system is the opportunity for price improvement and the advantage of the electronic system is speed of execution. The common view is that retail investors prefer better prices and professional traders prefer greater speed. This argument could be summarized, in the potential words of an advertising specialist, as "better pricing versus higher speed."

Gradually, however, these two market structures have converged significantly toward hybrid markets. Although both the NYSE and Nasdaq have converged toward hybrid markets from very different positions, their differences have remained significant. But as they became more similar in market structure and in other ways, the competition from other market venues became more intense. After the SEC approved new order handling rules in 1997, ECNs took larger shares first from Nasdaq and then, after 1999, when NYSE's Rule 390 was eliminated, from the NYSE. The NYSE and Nasdaq have also grown by acquiring other market venues. In addition, both the NYSE and Nasdaq have developed global relationships, Euronext for the NYSE and OMX Borse Dubai for the Nasdaq.

Meanwhile, some other forces have made it very difficult for either exchange or the ECNs to compete profitably for equity executions. Institutions, intermediaries, and increasingly hedge funds have become demanding with respect to three characteristics of execution services. The first is cost. Transactions costs in a very competitive, high turnover environment have become increasingly important. The second is speed. The volatility of the markets and the competition among market users have made "latency" a common concern. The third is anonymity. Hedge funds pursuing proprietary strategies and mutual funds whose buy and sell programs may endure over a long period require anonymous transactions.

As a result, ATSs have developed to satisfy these institutional market participant needs. Thus, while ECNs have been increasingly successful at competing with exchanges directly, crossing networks, dark pools, and internalization have competed with exchanges in very different ways based on their costs, speed, and anonymity. These mechanisms, however, fragment the central markets and depend on the central markets for price discovery. Thus, there are limits to their potential total activity or size.

Aggressive clients often consider the execution process in three levels. First, they try to cross orders internally where there would be no execution costs. If they do not have an internal match, they will then send their orders to a crossing network, which does not display quotes to avoid adverse price reactions. Finally, they send their orders to open markets or exchange only as a last resort. Some observers describe the orders that go to exchanges as "exhaust." In this regard, the data referred to herein indicate that the exchanges are trading a small share of their own listings.

In addition, Regulation NMS with its Trade-Through Rules levels the playing field among exchanges and ECNs. A common expectation is that Regulation NMS works to the advantage of the regional exchanges versus the NYSE and Nasdaq. There may, however, be few or no regional exchanges remaining.

But the competition is becoming more complex than simply the different execution venues competing with each other from different structures. Rather, they have begun competing against each other from similar structures. ECNs have and will become exchanges. While ATSs were the originators of dark pools and crosses, exchanges have also experimented with them (with the exception of buy-side to buy-side crosses). In addition, the importance of block trades diminishes as algorithmic trading reduces the trade size.

The upshot of these changes is that these execution venues all compete with each other and that the categories that formerly distinguished them are disappearing. The exchanges, ECNs, and ATSs will compete with each other for many of the same customers on the basis of the same functions and fees. Such competition may cause commoditization and a resulting low profitability for the providers of these services. Could equity transaction services follow the path of the U.S. inland water canals and the providers of some Internet services?

There may, however, be a limiting issue in such a development. The visible markets, the exchanges and ECNs, provide price discovery. Some of the other markets, crosses, dark pools, and internalization, do not provide price discovery, but rather have a free ride on the price discovery of the central and visible markets. But if the executions shift predominantly to the non-price discovery markets, how will prices be determined? This issue is similar to the issue in investments regarding active and passive investing and price discovery. That is, if all or most of the investors use a passive investment approach, there will be no active investors to provide the price discovery of the stocks. Opinions are not unanimous in either investments or stock execution.

KEY TERMS

- Algorithmic trading
- Alternative Display Facility (ADF)
- Alternative electronic markets
- Alternative trading systems (ATS)
- Auction market
- Bid quote
- Call auction
- Commission broker
- Competitive dealer, quote-based system
- Continuous market
- Crossing networks
- Dark pools
- Dealer market
- Direct market access (DMA)
- Electronic communication network (ECN)
- Exchange
- Floor brokers
- Fragmentation
- Hybrid market
- Internalization
- Limit order book
- Market structure
- National best bid and offer (NBBO)
- Natural buyers
- Natural sellers
- Offer quote
- Off-exchange markets
- Order-driven
- Preferencing
- Quote-driven
- Regional exchanges
- Specialist

QUESTIONS

1. How do order-driven and quote-driven market structures differ?
2. What is the role of natural buyers and natural sellers in order-driven markets?
3. Explain the two ways in which an order-driven market can be structured.
4. Who are the potential intermediaries in a quote-driven market?
5. Suppose the following quotes from three dealers:

Dealer	Bid	Offer
D	32.30	33.10
E	32.50	33.00
F	32.10	32.70
G	32.40	32.80

What is the NBBO?

6. This quotation is from an interview with William Donaldson, who at the time was the chairman of the NYSE, and appeared in the *New York Times* on January 30, 1990:

> There's a need to understand the advantages of an auction market versus a dealer market. The auction market allows a buyer and a seller to get together and agree on a price and the dealer is not involved at all. That's opposed to a dealer market where the house is on both sides of the trade and the dealer makes the spread rather than having the spread shared by the buyer and the seller. One of the things we're coming to the forefront on now is the whole idea of what makes a good market. I think the best market is where you have the maximum number of people coming together in a single location and bidding against each other. . . . That is far superior to what we are getting now, which is a fractionalization of the market. Traders on machines, trades in the closet, trades in many areas where buyers and sellers don't have the opportunity to meet.

a. What is meant by an auction market?
b. What is meant by a dealer market?
c. Discuss Mr. Donaldson's opinion. In your answer, be sure to address the pros and cons of the different trading structures addressed in the chapter.

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7. What is meant by a "fair and orderly market" on the NYSE?
8. Why is the Nasdaq referred to as a "fragmented market"?
9. What are the SuperDot and SuperMontage systems and what is their role?
10. What are the two sections of the Nasdaq stock market?
11. What are the three parts of the OTC market for stocks?
12. What is meant by off-exchange markets?
13. a. What is a crossing network?
    b. Name three crossing networks.
    c. What are the disadvantages of a crossing network?
14. a. What is a dark pool?
    b. What are the advantages of a dark pool?
    c. What are the disadvantages of a dark pool?
15. a. What is SEC Regulation NMS?
    b. What is the "Order Protection Rule" specified by Regulation NMS?
    c. What is the "Access Rule" specified by Regulation NMS?
16. a. What is meant by internalized trades?
    b. Why is the NYSE opposed to internalized trades?
17. a. What is meant by Direct Market Access?
    b. What are the advantages of DMA to buy-side firms?
18. a. What is algorithmic trading?
    b. Why is algorithmic trading used?



Markets for Corporate Senior Instruments: I

LEARNING OBJECTIVES

After reading this chapter, you will understand

- the various financing alternatives available to corporations
- the different forms of credit risk: default risk, credit spread risk, and downgrade risk
- the importance of credit ratings
- what commercial paper is
- the types of commercial paper: directly placed paper and dealer paper
- the differences between the U.S. commercial paper market and the Eurocommercial paper market
- what a medium-term note is
- what a syndicated loan is
- the two different ways a syndicated loan can be sold: assignment and participation
- the basic terms of a loan agreement
- what a lease financing transaction is
- the difference between a single-investor lease and a leveraged lease

Corporate senior instruments are financial obligations of a corporation that have priority over its common stock in the case of bankruptcy. They include debt obligations and preferred stock.

The market for corporate debt obligations can be classified into four sectors: (1) commercial paper market, (2) medium-term note market, (3) bank loan market, and (4) bond market. In this chapter, we look at the first four sectors. Unlike our discussion of common

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stock, in which we focused first on the U.S. equity market and then the non–U.S. equity market, here we discuss both the U.S. markets and Euromarkets in which corporations can borrow funds.

Securities such as commercial paper, Euronotes, medium-term notes, and bonds represent alternatives to bank loans for companies needing to raise funds. The issuance of securities in the international market has increased substantially since the 1980s, in stark contrast to the bank borrowing trend. This phenomenon of borrower preference for issuing securities over borrowing directly from banks is referred to as the *securitization* of capital markets. The term *securitization* is actually used in two ways. It is in the broader sense that we use it here. In the more narrow sense, the term *securitization*, more specifically, *asset securitization*, is used to describe the process of pooling loans and issuing securities backed by these loans.

CREDIT RISK

Unlike investing in a U.S. Treasury security, an investor who lends funds to a corporation by purchasing its debt obligation is exposed to *credit risk*. But what is credit risk? Traditionally credit risk is defined as the risk that the borrower will fail to satisfy the terms of the obligation with respect to the timely payment of interest and repayment of the amount borrowed. This form of credit risk is called *default risk*.

In addition to default risk, there are other risks associated with the investment in debt securities that are also components of credit risk. Even in the absence of default, the investor is concerned that the market value of a debt instrument will decline in value and/or the relative price performance of that instrument will be worse than that of other debt obligations, which the investor is compared against. The yield on a corporate debt instrument is made up of two components: (1) the yield on a similar maturity Treasury issue, and (2) a premium to compensate for the risks associated with the debt instrument that do not exist in a Treasury issue, referred to as a *spread*. The part of the risk premium or spread attributable to credit risk is called the *credit spread*.

The price performance of a non-Treasury debt obligation and its return over some investment horizon will depend on how the credit spread changes. If the credit spread increases—investors say that the spread has "widened"—the market price of the debt obligation will decline. The risk that an issuer's debt obligation will decline due to an increase in the credit spread is called *credit spread risk*.

We explained credit risk first in our discussion of municipal securities. Professional money managers analyze an issuer's financial information and the specifications of the debt instrument itself in order to estimate the ability of the issuer to live up to its future contractual obligations. This activity is known as *credit analysis*. Some large institutional investors have their own credit analysis department, but most individual and institutional investors do not conduct such analytical studies. Instead, they rely primarily on commercial rating companies that perform credit analysis and express their conclusions by a system of ratings. There are three commercial rating companies: Standard & Poor's Corporation, Moody's Investors Service, Inc., and Fitch. In the next chapter, we will explain the factors that credit-rating companies consider in assigning a rating.

Once a rating is assigned to a corporate debt instrument, it can be changed based on subsequent economic and financial developments. An improvement in the credit quality of

an issue or issuer is rewarded with a better credit rating, referred to as an *upgrade*; a deterioration in the credit quality of an issue or issuer is penalized by the assignment of an inferior credit rating, referred to as a *downgrade*. An unanticipated downgrading of an issue or issuer increases the credit spread sought by the market, resulting in a decline in the price of the issue or the issuer's debt obligation. This risk is referred to as *downgrade risk*.

The credit-rating companies play a key role in the functioning of debt markets. Investors take great comfort in knowing that the rating companies monitor the creditworthiness of issuers and keep the investing public informed of their findings. One would expect that other countries would have organizations that provide a similar function. This has not been the case. Only in recent years have credit-rating companies appeared in other countries. For example, in Japan, it was not until 1977 that a formal corporate bond-rating system was introduced. The original system for rating corporate bonds that was introduced in Japan in 1959 was based solely on the size of the issue.[1]

Key Points That You Should Understand Before Proceeding

1. Corporate debt obligations expose an investor to credit risk.
2. Credit risk consists of default risk, credit spread risk, and downgrade risk.
3. Credit risk is typically measured by the credit or quality ratings assigned by nationally recognized commercial rating companies.
4. Commercial rating companies play a key role in the functioning of debt markets in the United States, and their role in other countries is increasing.

COMMERCIAL PAPER

Commercial paper is a short-term unsecured promissory note issued in the open market that represents the obligation of the issuing corporation. The issuance of commercial paper is an alternative to bank borrowing for large corporations (nonfinancial and financial) with strong credit ratings.

While the original purpose of commercial paper was to provide short-term funds for seasonal and working capital needs, companies have used this instrument for other purposes in recent years. It has been used quite often for *bridge financing*. For example, suppose that a corporation needs long-term funds to build a plant or acquire equipment. Rather than raising long-term funds immediately, the corporation may elect to postpone the offering until more favorable capital market conditions prevail. The funds raised by issuing commercial paper are used until longer-term securities are sold.

In the United States, the maturity of commercial paper is typically less than 270 days, with the most common maturity range 30 to 50 days or less. There are reasons for this pattern of maturities. First, the Securities Act of 1933 requires that securities be registered with the Securities and Exchange Commission (SEC). Special provisions in the 1933 Act exempt commercial paper from registration so long as the maturity does not exceed 270 days. Hence, to avoid the costs associated with registering issues with the SEC, firms rarely issue commercial paper with maturities exceeding 270 days. Another consideration in

[1] Edwards W. Karp and Akira Koike, "The Japanese Corporate Bond Market," Chapter 11 in Frank J. Fabozzi (ed.), *The Japanese Bond Markets* (Chicago: Probus Publishing, 1990), p. 377.

determining the maturity is whether or not the commercial paper would be eligible collateral for a bank borrowing from the Federal Reserve Bank's discount window. In order to be eligible, the maturity of the paper may not exceed 90 days. Since eligible paper trades at a lower cost than paper that is not eligible, firms prefer to issue paper whose maturity does not exceed 90 days.

To pay off holders of maturing paper, issuers generally use the proceeds obtained by selling new commercial paper. This process is often described as rolling over short-term paper. The risk that the investor in commercial paper faces is that the issuer will be unable to sell new paper at maturity. As a safeguard against this rollover risk, commercial paper is typically backed by unused bank credit lines. The commitment fee the bank charges for providing a credit line increases the effective cost of issuing commercial paper.

Investors in commercial paper are institutional investors. Money market mutual funds purchase roughly one-third of all the commercial paper issued. Pension funds, commercial bank trust departments, state and local governments, and nonfinancial corporations seeking short-term investments purchase the balance. There are restrictions imposed on money market mutual funds by the SEC when investing in commercial paper. Rule 2a-7 of the Investment Company Act of 1940 limits the credit risk exposure of money market mutual funds by restricting their investments to "eligible" paper. Eligibility is defined in terms of the credit ratings. To be eligible paper, the issue must carry one of the two highest ratings ("1" or "2") from at least two of the credit rating companies. Tier-1 paper is defined as eligible paper that is rated "1" by at least two of the rating agencies; tier-2 paper security is defined as eligible paper that is not a tier-1 security. Money market funds may hold no more than 5% of their assets in the tier-1 paper of any individual issuer and no more than 1% of their assets in the tier-2 paper of any individual issuer. Furthermore, the holding of tier-2 paper may not represent more than 5% of the fund's assets.

There is very little secondary trading of commercial paper. Typically, an investor in commercial paper is an entity that plans to hold it until maturity. This is understandable because an investor can purchase commercial paper in a direct transaction with the issuer, which will sell paper with the specific maturity the investor desires.

Commercial paper is a discount instrument. That is, it is sold at a price that is less than its maturity value. The difference between the maturity value and the price paid is the interest earned by the investor, although there is some commercial paper that is issued as an interest-bearing instrument. For commercial paper, a year is treated as having 360 days.

The minimum round-lot transaction is $100,000, though some issuers will sell commercial paper in denominations of $25,000. The yield offered on commercial paper tracks that of other money market instruments. The commercial paper rate is higher than that on Treasury bills for the same maturity. There are three reasons for this. First, the investor in commercial paper is exposed to credit risk. Second, interest earned from investing in Treasury bills is exempt from state and local income taxes. As a result, commercial paper has to offer a higher yield to offset this tax advantage. Finally, commercial paper is less liquid than Treasury bills. The liquidity premium demanded is probably small, however, because investors typically follow a buy-and-hold strategy with commercial paper and so are less concerned with liquidity. The yield on commercial paper is higher by a few basis points than the yield on certificates of deposit for the same maturity. The higher yield available on commercial paper is attributable to the poorer liquidity relative to certificates of deposit.

Issuers of Commercial Paper

There are more than 1,700 issuers of commercial paper in the United States. Corporate issuers of commercial paper can be divided into fiancial companies and nonfinancial companies. There has been significantly greater use of commercial paper by financial companies.

There are three types of financial companies: **captive finance companies**, *bank-related finance companies*, and *independent finance companies*. Captive finance companies are subsidiaries of equipment manufacturing companies. Their primary purpose is to secure financing for the customers of the parent company. For example, the three major U.S. automobile manufacturers have captive finance companies: General Motors Acceptance Corporation (GMAC), Ford Credit, and Chrysler Financial. GMAC is by the far the largest issuer of commercial paper in the United States. Furthermore, a bank holding company may have a subsidiary that is a finance company, which provides loans to enable individuals and businesses to acquire a wide range of products. Independent finance companies are those that are not subsidiaries of equipment manufacturing firms or bank holding companies.

Although the issuers of commercial paper typically have high credit ratings, smaller and less well-known companies with lower credit ratings have been able to issue paper in recent years. They have been able to do so by means of credit support from a firm with a high credit rating (such paper is called *credit-supported commercial paper*) or by collateralizing the issue with high-quality assets (such paper is called *asset-backed commercial paper*). An example of credit-supported commercial paper is one supported by a *letter of credit* (LOC). The terms of a letter of credit specify that the bank issuing the letter guarantees that the bank will pay off the paper when it comes due, if the issuer fails to do so. The bank will charge a fee for the letter of credit. From the issuer's perspective the fee enables it to enter the commercial paper market and thereby obtain funding at a lower cost than that of bank borrowing. Commercial paper issued with this credit enhancement is referred to as **LOC paper**. The credit enhancement may also take the form of a surety bond from an insurance company.[2]

Both domestic and foreign corporations issue commercial paper in the United States. Commercial paper issued by foreign entities is called **Yankee commercial paper**.

The three rating companies assign ratings to commercial paper. These ratings are shown in Table 1.

Directly Placed versus Dealer-Placed Paper

Commercial paper is classified as either **direct paper** or **dealer-placed paper**. Directly placed paper is sold by the issuing firm directly to investors without the help of an agent or an intermediary. A large majority of the issuers of direct paper are financial companies. These entities require continuous funds in order to provide loans to customers. As a result, they find it cost-effective to establish a sales force to sell their commercial paper directly to investors. General Electric Capital Corporation (GE Capital) is an example of a direct issuer, having issued commercial paper for more than 50 years. GE Capital is the principal financial services arm of General Electric Company and is now the largest and most active direct issuer in the United States, with commercial paper outstanding of about $73 billion. The

[2] A surety bond is a policy written by an insurance company to protect another party against loss or violation of a contract.

Table 1 Commercial Paper Ratings

Category	Commercial Rating Company		
	Fitch	Moody's	S&P
Investment grade	F-1+	P-1	A-1+
	F-1		A-1
	F-2	P-2	A-2
	F-3	P-3	A-3
Noninvestment grade	F-6	NP (Not Prime)	B
			C
In default	D		D

** The definition of ratings varies by rating agency.*
Source: *Mitchell A. Post. "The Evolution of the U.S. Commercial Paper Market Since 1980," Federal Reserve Bulletin (December 1992), p. 882.*

Corporate Treasury unit of GE Capital manages the commercial paper programs of General Electric Company, GE Capital Services, GE Capital, and other GE-related programs. The paper is marketed directly to institutional investors on a continuous basis by Corporate Treasury or through GECC Capital Markets Group, Inc.

Dealer-placed commercial paper requires the services of an agent to sell an issuer's paper. The agent distributes the paper on a best efforts underwriting basis.

Non–U.S. Commercial Paper Markets

Other countries have developed their own commercial paper markets. For example, in November 1987, the Japanese Ministry of Finance (MOF) approved the issuance of commercial paper by Japanese corporations in its domestic market. A few months later, the MOF approved the issuance of yen-denominated commercial paper in Japan by non-Japanese entities. Such paper is referred to as **Samurai commercial paper.**

Eurocommercial paper is issued and placed outside the jurisdiction of the currency of denomination. There are several differences between U.S. commercial paper and Eurocommercial paper with respect to the characteristics of the paper and the structure of the market. First, commercial paper issued in the United States usually has a maturity of less than 270 days, with the most common maturity range 30 to 50 days or less. The maturity of Eurocommercial paper can be considerably longer. Second, while an issuer in the United States must have unused bank credit lines, it is possible to issue commercial paper without such backing in the Eurocommercial paper market. Third, while in the United States, commercial paper can be directly placed or dealer placed, Eurocommercial paper is almost always dealer placed. The fourth distinction is that numerous dealers participate in the Eurocommercial paper market, while only a few dealers dominate the market in the United States. Finally, because of the longer maturity of Eurocommercial paper, that paper is traded more often in the secondary market than U.S. commercial paper. Investors in commercial paper in the United States typically buy and hold to maturity, and the secondary market is thin and illiquid.

Key Points That You Should Understand Before Proceeding

1. Commercial paper is a short-term unsecured promissory note that is issued in the open market and represents the obligation of the issuing corporation. It is an alternative to bank borrowing for large corporations.
2. By using credit support, smaller and less well-known companies with lower credit ratings have been able to issue paper.
3. Commercial paper is rated by private rating companies.
4. Commercial paper can be directly placed by the issuer or issued by using the services of an agent or intermediary.
5. Other countries have developed their own commercial paper markets, and there is a Eurocommercial paper market.

MEDIUM-TERM NOTES

A **medium-term note** (MTN) is a corporate debt instrument, with the unique characteristic that notes are offered continuously to investors by an agent of the issuer. Investors can select from several maturity ranges: nine months to one year, more than one year to 18 months, more than 18 months to two years, and so on up to 30 years. Medium-term notes are registered with the SEC under Rule 415 (the shelf registration rule), which gives a corporation the maximum flexibility for issuing securities on a continuous basis.

The term *medium-term note* to describe this corporate debt instrument is misleading. Traditionally, the term *note* or *medium term* was used to refer to debt issues with a maturity greater than one year but less than 15 years. Certainly, this is not a characteristic of MTNs, since they have been sold with maturities from nine months to 30 years, and even longer. For example, in July 1993, Walt Disney Corporation issued a security with a 100-year maturity off its medium-term note shelf registration.

GMAC first used medium-term notes in 1972 to fund automobile loans with maturities of five years and less. The purpose of the MTN was to fill the funding gap between commercial paper and long-term bonds. It is for this reason that they are referred to as "medium term." The medium-term notes were issued directly to investors without the use of an agent. Only a few corporations issued MTNs in the 1970s. About $800 million of MTNs were outstanding by 1981.

The modern-day medium-term note was pioneered by Merrill Lynch in 1981. The first medium-term note issuer was Ford Motor Credit Company. By 1983, GMAC and Chrysler Financial used Merrill Lynch as an agent to issue medium-term notes. Merrill Lynch and other investment banking firms committed funds to make a secondary market for MTNs, thereby improving liquidity. In 1982, Rule 415 was adopted, making it easier for issuers to sell registered securities on a continuous basis.

Euro medium-term notes are those issued in the Euromarket. The market began in 1987. Euro medium-term notes are issued by sovereign issuers (i.e., governments and governmental agencies), nonfinancial corporations, and financial institutions. Euro medium-term notes have been issued in a variety of currencies. Most Euro medium-term notes were issued via the private placement market.

Size of Market and Issuers

The latest reported survey by the Federal Reserve for the amount of the MTNs outstanding is for 2004. In that year, there were $639 billion of MTNs outstanding issued by 132 firms using 440 programs. The importance of the MTN as a funding source is evidenced by the fact that MTN issuance exceeded the amount of corporate bond issuance in 2004.

The popularity of MTNs as a financing vehicle is due to the flexibility they provide borrowers in designing a structure that satisfies the needs of firms. They can issue fixed- or floating-rate debt. The coupon payments can be denominated in U.S. dollars or in a foreign currency. In the next chapter, we describe corporate bonds and the various security structures. These structures have been used by MTN issuers.

When the treasurer of a corporation is contemplating an offering of either MTNs or corporate bonds, there are two factors that affect the decision. The most obvious is the cost of the funds raised after consideration of registration and distribution costs. This cost is referred to as the *all-in-cost of funds*. The second is the flexibility afforded to the issuer in structuring the offering. The tremendous growth in the MTN market is evidence of the relative advantage of MTNs with respect to cost and flexibility for some offerings. However, the fact that there are corporations that raise funds by issuing both bonds and MTNs is evidence that there is no absolute advantage in all instances and market environments.

As with commercial paper, MTNs are rated by the nationally recognized rating companies. Most outstanding MTNs are rated investment grade.

The Primary Market

Medium-term notes differ from corporate bonds in the manner in which they are distributed to investors when they are initially sold. Although some investment-grade corporate bond issues are sold on a best efforts basis, they are typically underwritten by investment bankers. MTNs have been traditionally distributed on a best efforts basis by either an investment banking firm or other broker-dealers acting as agents. Another difference between corporate bonds and MTNs when they are offered is that MTNs are usually sold in relatively small amounts on a continuous or an intermittent basis, while corporate bonds are sold in large, discrete offerings.

A corporation that wants an MTN program will file a shelf registration with the SEC for the offering of securities. While the SEC registration for MTN offerings is between $100 and $1 billion, once the total is sold, the issuer can file another shelf registration.[3] The registration will include a list of the investment banking firms, usually two to four, that the corporation has arranged to act as agents to distribute the MTNs. The large New York–based investment banking firms dominate the distribution market for MTNs.

The issuer then posts rates over a range of maturities: for example, nine months to one year, one year to 18 months, 18 months to two years, and annually thereafter. Table 2 provides an example of an offering rate schedule for a medium-term note program. Usually, an issuer will post rates as a spread over a Treasury security of comparable maturity. For example, in the two- to three-year maturity range, the offering rate is 35 basis points over the two-year Treasury. Since the two-year Treasury is shown in the table at 4%,

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[3] Leland E. Crabbe, "Medium-Term Notes," Chapter 12 in Frank J. Fabozzi (ed.), *The Handbook of Fixed Income Securities*, 6th ed. (New York: McGraw Hill, 2001).

Table 2 An Offering Rate Schedule for a Medium-Term Note Program

Medium-Term Notes			Treasury Securities	
Maturity Range	Yield (%)	Yield spread of MTN over Treasury Securities (basis points)	Maturity	Yield (%)
9 months to 12 months	(a)	(a)	9 months	3.35
12 months to 18 months	(a)	(a)	12 months	3.50
18 months to 2 years	(a)	(a)	18 months	3.80
2 years to 5 years	4.35	35	2 years	4.00
3 years to 4 years	5.05	55	3 years	4.50
4 years to 5 years	5.60	60	4 years	5.00
5 years to 6 years	6.05	60	5 years	5.45
6 years to 7 years	6.10	40	6 years	5.70
7 years to 8 years	6.30	40	7 years	5.90
8 years to 9 years	6.45	40	8 years	6.05
9 years to 10 years	6.60	40	10 years	6.20
10 years	6.70	40	10 years	6.30

[a] No rate posted.

Source: *Leland E. Crabbe, "The Anatomy of the Medium-Term Note Market,"* Federal Reserve Bulletin *(August 1993), p. 753.*

the offering rate is 4.35%. Rates will not be posted for maturity ranges that the issuer does not desire to sell. For example, in Table 2, the issuer does not wish to sell MTNs with a maturity of less than two years.

The agents will then make the offering rate schedule available to their investor base interested in MTNs. An investor who is interested in the offering will contact the agent. In turn, the agent contacts the issuer to confirm the terms of the transaction. Since the maturity range in the offering rate schedule does not specify a specific maturity date, the investor can choose the final maturity subject to approval by the issuer. The minimum size that an investor can purchase of an MTN offering typically ranges from $1 million to $25 million.

The rate offering schedule can be changed at any time by the issuer either in response to changing market conditions or because the issuer has raised the desired amount of funds at a given maturity. In the latter case, the issuer can either not post a rate for that maturity range or lower the rate.

Structured Medium-Term Notes

It is common today for issuers of MTNs to couple their offerings with transactions in the derivative markets (options, futures/forwards, swaps, caps, and floors) so as to create debt obligations with more interesting risk/return features than are available in the corporate bond market. Specifically, an issue can be floating rate over all or part of the life of the security and the coupon reset formula can be based on a benchmark interest rate, equity index or individual stock price, a foreign exchange rate, or a commodity index. There are

even MTNs with coupon reset formulas that vary inversely with a benchmark interest rate. That is, if the benchmark interest rate increases (decreases), the coupon rate decreases (increases). Debt instruments with this coupon characteristic are called *inverse floating-rate securities.*

MTNs created when the issuer simultaneously transacts in the derivative markets are called **structured notes.** It is estimated today that new-issue volume of structured notes is 20% to 30% of new-issuance volume. The most common derivative instrument used in creating structured notes is a swap.

Key Points That You Should Understand Before Proceeding

1. A unique characteristic of medium-term notes is that they are continuously offered to investors over a period of time by an agent of the issuer.
2. Medium-term notes are rated by the nationally recognized rating companies.
3. Investors can select issues from several maturity bands.
4. Unlike corporate bonds, medium-term notes are typically issued on a best efforts basis rather than underwritten by an investment banker.
5. A structured note is a medium-term note in which the issuer couples its offering with a position in a derivative instrument in order to create instruments with more interesting risk/return characteristics.

BANK LOANS

As an alternative to the issuance of securities, a corporation can raise funds by borrowing from a bank.[4] There are five sourcing alternatives for a corporation: (1) a domestic bank in the corporation's home country, (2) a subsidiary of a foreign bank that is established in the corporation's home country, (3) a foreign bank domiciled in a country where the corporation does business, (4) a subsidiary of a domestic bank that has been established in a country where the corporation does business, or (5) an offshore or Eurobank. Loans made by offshore banks are referred to as **Eurocurrency loans.**[5]

Secondary Market for Bank Loans

While at one time, a bank or banks who originated loans retained them in their loan portfolio, today those loans can be traded in the secondary market or securitized to create *collateralized loan obligations* (CLO) using the securitization technology.

The trade association that has been the main advocate of commercial loans as an asset class is the **Loan Syndications and Trading Association (LSTA),** formed in 1995. The LSTA has helped foster the development of a liquid and transparent secondary market for bank loans by establishing market practices and settlement and operational procedures. The LSTA collects quotes on 2,500 U.S. loans on a daily basis. Quotes for three loans for

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[4] Bank debt is widely used as the senior financing for a leveraged buyout, acquisition, or recapitalization. These are collectively referred to as *highly leveraged transactions* or HLTs.

[5] A loan can be denominated in a variety of currencies. Loans denominated in U.S. dollars are called *Eurodollar loans.* Similarly, there are *Euroyen loans.*

four companies as reported on the website of the LSTA for the week ending Friday, July 14, 2006, were as follows:

Name	Loan Rating Moody's/S&P	Coupon	Maturity	Average bid (pct. pts.)	Weekly change (pct. pts.)
Regal Cinemas, Inc.	N.R./BB-	L+225	Oct. 19, '10	99.43	−0.41
El Paso Corp.	B3/B+	L+275	Nov. 23, '09	100.21	−0.36
Lear Corp.	Baa3/B+	L+250	Mar. 29, '12	99.35	+0.31
Wynn Resorts	B2/B+	L+212.5	Dec. 14, '11	100.06	−0.15

The second column is the rating assigned by Moody's and S&P. An "N.R." means not rated. (The meaning of these ratings is explained in the next chapter.) The "L" in the second column means LIBOR. The next-to-the-last column shows the average bid price for the loan. The quote is the same as used for bonds (i.e., as a percentage of par). The last column shows the change in price.

The LSTA has also developed a loan index (the S&P/LSTA Leveraged Loan Index) to gauge the performance of the different sectors of the syndicated loan market.

Syndicated Bank Loans

A **syndicated bank loan** is one in which a group (or syndicate) of banks provides funds to the borrower. The need for a group of banks arises because the amount sought by a borrower may be too large for any one bank to be exposed to the credit risk of that borrower. Therefore, the syndicated bank loan market is used by borrowers who seek to raise a large amount of funds in the loan market rather than through the issuance of securities.

These bank loans are called **senior bank loans** because they have a priority position over subordinated lenders (bondholders) with respect to repayment of interest and principal. The interest rate on a syndicated bank loan is a rate that **floats**, which means that the loan rate is based on some reference rate. The loan rate is periodically reset at the reference rate plus a spread. The reference rate is typically the London Interbank Offered Rate (LIBOR), although it could be the prime rate (that is, the rate that a bank charges its most creditworthy customers) or the rate on certificates of deposit. The term of the loan is fixed. A syndicated loan is typically structured so that it is amortized according to a predetermined schedule, and repayment of principal begins after a specified number of years (typically not longer than five or six years). Structures in which no repayment of the principal is made until the maturity date can be arranged. Such loan structures are referred to as **bullet loans**.

A syndicated loan is arranged by either a bank or a securities house. The arranger then lines up the syndicate. Each bank in the syndicate provides the funds for which it has committed. The banks in the syndicate have the right to sell their parts of the loan subsequently to other banks.

Syndicated loans are distributed by two methods: assignment or participation. Each method has its relative advantages and disadvantages, with the method of assignment the more desirable of the two.

The holder of a loan who is interested in selling a portion can do so by passing the interest in the loan by the *method of assignment*. In this procedure, the seller transfers all rights completely to the holder of the assignment, now called the *assignee*. The assignee is

said to have *privity of contract* with the borrower. Because of the clear path between the borrower and assignee, assignment is the more desirable choice of transfer and ownership.

A *participation* involves a holder of a loan "participating out" a portion of the holding in that particular loan. The holder of the participation does not become a party to the loan agreement, and has a relationship not with the borrower but with the seller of the participation. Unlike an assignment, a participation does not confer privity of contract on the holder of the participation, although the holder of the participation has the right to vote on certain legal matters concerning amendments to the loan agreement. These matters include changes regarding maturity, interest rate, and issues concerning the loan collateral. Because syndicated loans can be sold in this manner, they have become marketable.

In response to the large amount of bank loans issued in the 1980s and their strong credit protection, some commercial banks and securities houses have shown a willingness to commit capital and resources to facilitate trading as broker-dealers. Also, these senior bank loans have been securitized through the process for the securitization of mortgage loans. Further development of the senior bank loan market will no doubt eventually erode the once important distinction between a security and a loan: A security has long been seen as a marketable financial asset, while a loan has not been marketable. Interestingly, the trading of these loans is not limited to **performing loans**, which are loans whose borrowers are fulfilling contractual commitments. There is also a market in the trading of nonperforming loans—loans in which the borrowers have defaulted.

Lease Financing

The market for lease financing is a segment of the larger market for equipment financing. Any type of equipment that can be purchased with borrowed funds can also be leased. Our interest here is in the leasing of equipment that can be classified as a big-ticket item (that is, equipment costing more than $5 million). Included in this group are commercial aircraft, large ships, large quantities of production equipment, and energy facilities. A special type of leasing arrangement, known as a **leveraged lease**, is used in financing such equipment.

Leasing works as follows. The potential equipment user, called the **lessee**, first selects the equipment and the dealer or manufacturer from whom the equipment will be purchased. The lessee negotiates such aspects of the transaction as the purchase price, specifications, warranties, and delivery date. When the lessee accepts the terms of the deal, another party, such as a bank or finance company, buys the equipment from the dealer or manufacturer and leases it to the lessee. This party is called the **lessor**. The lease is so arranged that the lessor realizes the tax benefits associated with the ownership of the leased equipment.

Basically, leasing is a vehicle by which tax benefits can be transferred from the user of the equipment (the lessee), who may not have the capacity to take advantage of the tax benefits associated with equipment ownership (such as depreciation and any tax credits), to another entity who can utilize them (the lessor). In exchange for these tax benefits, a lessor provides lower-cost financing to the lessee than the lessee could get by purchasing the equipment with borrowed funds. Such leases are referred to as **tax-oriented leases**.

There are two possible ways for the lessor to finance the purchase of the equipment. One way is to provide all the financing from its own funds and therefore be at risk for 100% of the funds used to purchase the equipment. Such leasing arrangements are referred to as **single-investor or direct leases**. Essentially, such leases are two-party agreements (the lessee and the lessor). The second way is for the lessor to use only a portion of its own funds

to purchase the equipment, and to borrow the balance from a bank or group of banks. This type of leasing arrangement is called a *leveraged lease*. There are three parties to a leveraged lease agreement: the lessee, the lessor, and the lender. The leveraged lease arrangement allows the lessor to realize all the tax benefits from owning the equipment and the tax benefits from borrowing funds—deductible interest payments—while putting up only a portion of its own funds to purchase the equipment. Because of this, leveraged leasing is commonly used in financing big-ticket items.

In a leveraged lease transaction, it is necessary for a party to arrange for the equity and the debt portions of the funding involved. The same party can arrange both. The equity portion is typically provided by one or more institutional investors. The debt portion is arranged with a bank. Since leveraged lease transactions are for large-ticket items, the bank debt is typically arranged as a syndicated bank loan.

The financing of aircraft is normally accomplished through leveraged lease financing. For example, between May and October 1991, Japanese banks arranged $1 billion in leveraged lease financing for airlines throughout the world.[6] One large Japanese bank, Mitsubishi Trust, arranged for a total of almost $250 million of equity and debt financing for British Airways to acquire four aircraft. Mitsubishi Trust also arranged for the equity financing in purchases by Quantas.[7]

Key Points That You Should Understand Before Proceeding

1. Bank loans are an alternative to the issuance of securities.
2. A syndicated bank loan is one in which a group of banks provides funds to the borrower, with the reference rate on the loan typically the London Interbank Offered Rate.
3. Senior loans can be distributed by either assignment or participation.
4. Any type of equipment that can be purchased with borrowed funds can also be leased.
5. A tax-oriented lease effectively allows the lessee to obtain financing at less cost than by bank borrowing.

SUMMARY

Corporate senior instruments include debt obligations and preferred stock. Holders of these obligations have priority over holders of a corporation's common stock in the case of bankruptcy. In this chapter we discuss four sectors of this market: the commercial paper market, the medium-term note market, and the bank loan market.

Investors typically do not perform their own analysis of the issuer's creditworthiness. Instead, they rely on a system of credit ratings developed by commercial ratings companies. The three companies in the United States that rate corporate debt in terms of the likelihood of default are (1) Moody's Investors Service, (2) Standard & Poor's Corporation, and (3) Fitch.

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[6] *International Financial Review*, Issue 902 (November 2, 1991), p. 12.
[7] *International Financial Review*, Issue 902 (November 2, 1991), p. 11.

Commercial paper is a short-term unsecured promissory note issued in the open market that represents the obligation of the issuing entity. Generally, commercial paper maturity is less than 90 days. Financial and nonfinancial corporations issue commercial paper, with the majority issued by the former. Directly placed paper is sold by the issuing firm directly to investors without using an agent as an intermediary; for dealer-placed commercial paper, the issuer uses the services of an agent to sell its paper. Commercial paper markets have been developed in other countries. Eurocommercial paper is paper issued and placed outside the jurisdiction of the currency of denomination.

Medium-term notes are corporate debt obligations offered on a continuous basis. The maturities range from nine months to 30 years and have provided a financing alternative with maturities between those of commercial paper and long-term bonds.

Bank loans represent an alternative to the issuance of securities. A syndicated bank loan is one in which a group of banks provides funds to the borrower. Senior bank loans have become marketable; they are now more actively traded and have been securitized.

Leasing is a form of bank borrowing. Basically leasing is a vehicle by which tax benefits can be transferred from the user of the equipment (the lessee), who may not have the capacity to utilize the tax benefits associated with equipment ownership, to another entity who can utilize them. A single-investor lease is a two-party agreement involving the lessee and the lessor. In a leveraged lease, the lessor uses only a portion of its own funds to purchase the equipment and borrows the balance from a bank or group of banks.

KEY TERMS

- Bullet loan
- Captive finance companies
- Commercial paper
- Dealer-placed paper
- Direct paper
- Eurocommercial paper
- Eurocurrency loans
- Euro medium-term notes
- Floats
- Lessee
- Lessor
- Leveraged lease
- Loan Syndications and Trading Association (LSTA)
- LOC paper
- Medium-term note (MTN)
- Performing loan
- Samurai commercial paper
- Senior bank loan
- Single-investor (direct) lease
- Structured note
- Syndicated bank loan
- Tax-oriented leases
- Yankee commercial paper

QUESTIONS

1. What are the different forms of credit risk?
2. What role do rating companies play in financial markets?
3. What is meant by a credit or quality spread?
4. **a.** Why is commercial paper an alternative to short-term bank borrowing for a corporation?.
   b. What is the difference between directly placed paper and dealer-placed paper?
5. What does the yield spread between commercial paper and Treasury bills of the same maturity reflect?
6. **a.** What is Eurocommercial paper?
   b. How does it differ from U.S. commercial paper?

a. What is a medium-term note?
b. What determines the yield that will be offered on a MTN?
c. What is a Euro medium-term note?

Explain whether you agree or disagree with the following statements.

a. MTNs are issued for maturities from one year to five years.
b. MTNs are issued by low credit rated corporations.
c. MTNs are much less frequently used as a funding source compared to corporate bonds.

What is a structured note?

What has The Loan Syndications and Trading Association done to enhance commercial loans secondary market trading?

11. a. What is a syndicated bank loan?
    b. What is the reference rate typically used for a syndicated bank loan?
    c. What is the difference between an amortized bank loan and a bullet bank loan?
12. Explain the two ways in which a bank can sell its position in a syndicated loan.
13. a. For a lease financing transaction, who is the lessee and the lessor?
    b. Who is entitled to the tax benefits, and what are those tax benefits?
    c. If a manufacturing corporation has no taxable income, is it likely to buy equipment or lease equipment? Why?
14. What is the difference between a single-investor lease and a leveraged lease?

Markets for Corporate Senior Instruments: II

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CORPORATE BONDS

Corporate bonds are classified by the type of issuer. The four general classifications used by bond information services are: (1) utilities, (2) transportations, (3) industrial, and (4) banks and finance companies. Finer breakdowns are often made to create more homogeneous groupings. For example, utilities are subdivided into electric power companies, gas distribution companies, water companies, and communication companies. Transportations are further divided into airlines, railroads, and trucking companies. Industrials are the catchall class, and the most heterogeneous of the groupings with respect to investment characteristics. Industrials include all kinds of manufacturing, merchandising, and service companies. In recent years, industrials have raised the largest amount in the corporate bond market, followed by financial institutions and then utilities.[1] The largest investor group is life insurance companies, followed by pension funds, public and private. Historically, these institutional investors hold more than half of outstanding corporate bonds. The balance is held by households, foreign investors, depository institutions, non-life insurance companies, and mutual funds and securities brokers and dealers.

Basic Features of a Corporate Bond Issue

The essential features of a corporate bond are relatively simple. The corporate issuer promises to pay a specified percentage of par value (known as the coupon payments) on designated dates, and to repay par or principal value of the bond at maturity. Failure to pay either principal or interest when due constitutes legal default, and court proceedings can be instituted to enforce the contract. Bondholders, as creditors, have a prior legal claim over common and preferred stockholders as to both income and assets of the corporation for the principal and interest due them.

The promises of corporate bond issuers and the rights of investors who buy them are set forth in great detail in contracts called **bond indentures**. If bondholders were handed the complete indenture, they would have trouble understanding its language, and even greater difficulty in determining at a particular time whether or not the corporate issuer were keeping all its promises. These problems are solved for the most part by bringing in a *corporate trustee as a third party to the contract.* The indenture is made out to the corporate trustee as a representative of the interests of bondholders; that is, the trustee acts in a fiduciary capacity for investors who own the bond issue. A corporate trustee is a bond or trust company with a corporate trust department and officers who are experts in performing the functions of a trustee.

A bond's indenture clearly outlines three important aspects: its maturity, its security, and its provisions for retirement.

Maturity of Bonds

Most corporate bonds are *term bonds*; that is, they run for a term of years, then become due and payable. Term bonds are often referred to as **bullet-maturity**, or, simply, **bullet bonds**. Any amount of the liability that has not been paid off prior to maturity must be paid off at

[1] *Moody's Bond Survey*, selected, year-end issues.

that time. The bond's term may be long or short. Generally, obligations due less than ten years from the date of issue are called *notes.*[2]

Most corporate borrowings take the form of *bonds* due in 20 to 30 years. Term bonds may be retired by payment at final maturity or retired prior to maturity if provided for in the indenture. Some corporate bond issues are so arranged that specified principal amounts become due on specified dates prior to maturity. Such issues are called **serial bonds.** Equipment trust certificates (discussed later) are structured as serial bonds.

Security for Bonds

Either real property (using a mortgage) or personal property may be pledged to offer security beyond that of the general credit standing of the issuer. A **mortgage bond** grants the bondholders a lien against the pledged assets. A *lien* is a legal right to sell mortgaged property to satisfy unpaid obligations to bondholders. In practice, foreclosure and sale of mortgaged property are unusual. If a default occurs, there is usually a financial reorganization of the issuer when provision is made for settlement of the debt to bondholders. The mortgage lien is important, though, because it gives the mortgage bondholders a very strong bargaining position relative to other creditors in determining the terms of a reorganization.

Some companies do not own fixed assets or other real property, and so have nothing on which they can give a mortgage lien to secure bondholders. Instead, these firms own securities of other companies and, thus, are *holding companies.* The firms whose shares are owned are *subsidiaries.* To satisfy the desire of bondholders for security, the holding companies pledge stocks, notes, bonds, or whatever other kind of financial instruments they own. These assets are termed *collateral* (or personal property), and bonds secured by such assets are called **collateral trust bonds.**

Many years ago, the railway companies developed a way of financing the purchase of cars and locomotives, called *rolling stock,* that enabled them to borrow at just about the lowest rates in the corporate bond market. Railway rolling stock has for a long time been regarded by investors as excellent security for debt. The equipment is sufficiently standardized that it can be used by one railway as well as another. And, of course, it can readily be moved from the tracks of one railroad to those of another. Therefore, there is generally a good market for lease or sale of cars and locomotives. The railroads have taken advantage of these characteristics of rolling stock by developing a legal arrangement for giving investors a legal claim on it that is different from, and generally superior to, a mortgage lien.

The legal arrangement in this situation is one that vests legal title to railway equipment in a trustee. When a railway company orders some cars and locomotives from a manufacturer, the manufacturer transfers legal title to the equipment to a trustee. The trustee, in turn, leases the equipment to the railroad, and at the same time sells **equipment trust certificates** to obtain the funds to pay the manufacturer. The trustee collects lease payments from the railroad and uses these receipts to pay interest and principal on the certificates. The principal is therefore paid off on specified dates, a provision that makes a certificate different from a term bond.

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[2] It can be seen that the word *notes* is used to describe a variety of instruments—medium-term notes and Euronotes. The use of the term *notes* here is as a market convention distinguishing notes and bonds on the basis of the number of years to maturity at the time the security is issued.

The general idea of the equipment trust arrangement has also been used by companies engaged in providing other kinds of transportation. For example, trucking companies finance the purchase of huge fleets of trucks in the same manner; airlines use this kind of financing to purchase transport planes; and international oil companies use this financing method to buy huge tankers.

A **debenture bond** is not secured by a specific pledge of property, but that does not mean that this type of bond has no claim on property of issuers or on their earnings. Debenture bondholders have the claim of general creditors on all assets of the issuer not pledged specifically to secure other debt. Also, holders of debentures even have a claim on pledged assets to the extent that these assets have value greater than necessary to satisfy secured creditors. A **subordinated debenture bond** is an issue that ranks after secured debt, after debenture bonds, and often after some general creditors in its claim on assets and earnings.

The type of corporate security issued determines the cost to the issuer. For a given corporation, mortgage bonds will cost less than debenture bonds; debenture bonds will cost less than subordinated debenture bonds.

A **guaranteed bond** is an obligation guaranteed by another entity. The safety of a guaranteed bond depends upon the financial capability of the guarantor to satisfy the terms of the guarantee, as well as the financial capability of the issuer. The terms of the guarantee may call for the guarantor to guarantee the payment of interest and/or repayment of the principal.

It is important to recognize that a superior legal status will not prevent bondholders from suffering financial loss when the issuer's ability to generate cash flow adequate to pay its obligations is seriously eroded.

Provisions for Paying Off Bonds

Most corporate issues have a call provision allowing the issuer an option to buy back all or part of the issue prior to maturity. Some issues carry a sinking fund provision, which specifies that the issuer must retire a predetermined amount of the issue periodically.[3]

An important question in negotiating the terms of a new bond issue is whether or not the issuer shall have the right to redeem the *entire amount* of bonds outstanding on a date before maturity. Issuers generally want this right because they recognize that at some time in the future the general level of interest rates may fall sufficiently below the issue's coupon rate, so that redeeming the issue and replacing it with another issue carrying a lower coupon rate would be attractive. For reasons discussed later in this chapter, this right represents a disadvantage to the bondholder.

The usual practice is a provision that denies the issuer the right to redeem bonds during the first five to 10 years following the date of issue with proceeds received from the sale of lower-cost debt obligations that have an equal or superior rank to the debt to be redeemed. This type of redemption is called **refunding**. While most long-term issues have these refunding restrictions, they may be immediately callable, in whole or in part, if the source of funds is something other than money raised with debt of a lower interest. Under such a provision, acceptable sources include cash flow from operations, proceeds from a common stock sale, or funds from the sale of property.

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[3] For a more detailed explanation of corporate call provisions, see Richard S. Wilson and Frank J. Fabozzi, *Corporate Bonds: Structures & Analysis* (New Hope, PA: Frank J. Fabozzi Associates, 1996).

Investors often confuse refunding protection with call protection. Call protection is much more comprehensive because it prohibits the early redemption of the bonds *for any reason*. Refunding restrictions, by contrast, provide protection only against the one type of redemption previously mentioned.

As a rule, corporate bonds are callable at a premium above par. Generally, the amount of the premium declines as the bond approaches maturity and often reaches zero after a number of years following issuance. The initial amount of the premium may be as much as one year's coupon interest, or as little as the coupon interest for half of a year.

If the issuer has the choice to retire all or part of an issue prior to maturity, the buyer of the bond takes the chance that the issue will be called away at a disadvantageous time. This risk is referred to as **call risk**, or **timing risk**. There are two disadvantages of call provisions from the investor's perspective. First, a decline in interest rates in the economy will increase the price of a debt instrument, although in the case of a callable bond, the price increase is somewhat limited. If and when interest rates decline far enough below the coupon rate to make call an immediate or prospective danger, the market value of the callable bond will not rise as much as that of noncallable issues that are similar in all other respects. Second, when a bond issue is called as a result of a decline in interest rates, the investor must reinvest the proceeds received at a lower interest rate (unless the investor chooses debt of greater risk).

Corporate bond indentures may require the issuer to retire a specified portion of an issue each year. This **sinking fund provision** for the repayment of the debt may be designed to liquidate all of a bond issue by the maturity date, or it may call for the liquidation of only a part of the total by the end of the term. If only a part of the outstanding bond is paid before retirement, the remainder is called a *balloon maturity*. The purpose of the sinking fund provision is to reduce credit risk. Generally, the issuer may satisfy the sinking fund requirement by either (1) making a cash payment of the face amount of the bonds to be retired to the corporate trustee, who then calls the bonds for redemption using a lottery, or (2) delivering to the trustee bonds with a total face value equal to the amount that must be retired from bonds purchased in the open market.

Bonds with Special Features

Prior to the 1970s, securities issued in the U.S. bond market had a simple structure. They had a fixed coupon rate and a fixed maturity date. The only option available to the issuer was the right to call all or part of the issue prior to the stated maturity date. The historically high interest rates that prevailed in the United States in the late 1970s and early 1980s, and the volatile interest rates since the 1970s, prompted introduction of new structures or the increased use of existing structures with special features that made issues more attractive to both borrowers and investors. Various bond structures are reviewed in the following text.

Convertible and Exchangeable Bonds

The conversion provision in a corporate bond issue grants the bondholder the right to convert the bond to a predetermined number of shares of common stock of the issuer. A **convertible bond** is, therefore, a corporate bond with a call option to buy the common stock of the issuer. An **exchangeable bond** grants the bondholder the right to exchange the bonds for the common stock of a firm *other* than the issuer of the bond. For example, Ford

Motor Credit exchangeable bonds are exchangeable for the common stock of its parent company, Ford Motor Company.

Issues of Debt with Warrants

Warrants may be attached as part of a bond issue. A warrant grants the holder the right to purchase a designated security at a specified price from the issuer of the bond. A warrant is simply a call option. It may permit the holder to purchase the common stock of the issuer of the debt or the common stock of a firm other than the issuer's. Or, the warrant may grant the holder the right to purchase a debt obligation of the issuer. Generally, warrants can be detached from the bond and sold separately. Typically, in exercising the warrant, an investor may choose either to pay cash or to offer the debt, to be valued at par, that was part of the offering. A major difference between warrants and either convertible or exchangeable bonds is that an investor exercising the option provided by the latter must turn the bond in to the issuer.

Putable Bonds

A **putable bond** grants the bondholder the right to sell the issue back to the issuer at par value on designated dates. The advantage to the bondholder is that if interest rates rise after the issue date, thereby reducing the market value of the bond, the bondholder can sell the bond back to the issuer for par.

Zero-Coupon Bonds

Zero-coupon bonds are, just as the name implies, bonds without coupon payments or a stated interest rate. In the Treasury market, the U.S. government does not issue zero-coupon bonds. Dealers strip issues and create these bonds from the cash flow of a coupon Treasury bond. Corporations, however, can and do issue zero-coupon bonds. The first such public offering was in the spring of 1981. The attractiveness of a zero-coupon bond from the investor's perspective is that the investor who holds the bond to the maturity date will realize a predetermined return on the bond, unlike a coupon bond where the actual return realized, if the bond is held to maturity, depends on the rate at which coupon payments can be reinvested.

Floating-Rate Securities

The coupon interest on **floating-rate securities** is reset periodically to follow changes in the level of some predetermined benchmark rate. For example, the coupon rate may be reset every six months to a rate equal to a spread of 100 basis points over the six-month Treasury bill rate.

Floating-rate securities are attractive to some institutional investors because they allow them to buy an asset with an income stream that closely matches the floating nature of the income of some of their liabilities. Certain floating-rate instruments are viewed by some investors as a passive substitute for short-term investments, particularly that part of a short-term portfolio that is more or less consistently maintained at certain minimum levels. Thus, floating-rate securities save on the costs of constantly rolling over short-term securities as they reach maturity.

Why do corporations issue floating-rate securities? Closer matching of their income flows from variable-rate assets with floating-rate liabilities is of major importance, especially with lenders such as banks, thrifts, and finance companies. Issuers can fix or lock in a spread between the cost of borrowed funds and the rate at which those funds are lent out. Another reason might be to avoid uncertainties associated with what could be an unreceptive market at some future date. The issuer can tap a new source for intermediate- to long-term funds at short-term rates, thereby making fewer trips to the marketplace and avoiding related issuance costs.

Also, in the presence of inflation, a floating-rate security (rolled over, if needed) may have a lower interest cost than a fixed-rate, long-term security. The reason is that, with inflation, the long rate may incorporate a substantial premium against the uncertainty of future inflation and interest rates. Finally, an issuer may find that it can issue a floating-rate security and convert its payments into a fixed-rate stream through an interest rate swap agreement. An issuer will elect this approach if the cost of issuing a floating-rate security and then using an interest rate swap will result in a lower cost than simply issuing a fixed-rate security.

There may be other features in a floating-rate issue. For example, many floating-rate issues include a put option. Some issues are exchangeable either automatically at a certain date (often five years after issuance) or at the option of the issuer into fixed-rate securities. A few issues are convertible into the common stock of the issuer. Some floating-rate issues have a ceiling or maximum interest rate for the coupon rate; some have a floor or minimum interest rate for the coupon rate.

Corporate Bond Credit Ratings

As we stated in the previous chapter, market participants typically do not do their own credit analysis of a debt obligation. Instead, they rely primarily on nationally recognized rating companies that perform credit analyses and issue their conclusions in the form of ratings. The three nationally recognized rating companies are (1) Moody's Investors Service, (2) Standard & Poor's Corporation, and (3) Fitch. The rating systems use similar symbols, as shown in Table 1.

In all systems, the term *high grade* means low credit risk, or conversely, high probability of future payments. The highest-grade bonds are designated by Moody's by the symbol Aaa, and by the other three rating systems by the symbol AAA. The next highest grade is denoted by the symbol Aa (Moody's) or AA (the other three rating systems); for the third grade all rating systems use A. The next three grades are Baa or BBB, Ba or BB, and B, respectively. There are also C grades. Moody's uses 1, 2, or 3 to provide a narrower credit quality breakdown within each class, and the other three rating companies use plus and minus signs for the same purpose.

Bonds rated triple A (AAA or Aaa) are said to be *prime*; double A (AA or Aa) are of high quality; single A issues are called *upper medium grade*, and triple B are *medium grade*. Lower-rated bonds are said to have speculative elements or be distinctly speculative.

Bond issues that are assigned a rating in the top four categories are referred to as **investment-grade bonds**. Issues that carry a rating below the top four categories are referred to as *noninvestment-grade bonds*, or more popularly as **high-yield bonds or junk bonds**. Thus, the corporate bond market can be divided into two sectors: the investment-grade and noninvestment-grade markets.

Table 1 Summary of Corporate Bond Rating Systems and Symbols

Moody's	S&P	Fitch	Brief Definition
	INVESTMENT GRADE—HIGH CREDITWORTHINESS		
Aaa	AAA	AAA	Gilt edge, prime, maximum safety
Aa1	AA+	AA+	Very high grade, high quality
Aa2	AA	AA	
Aa3	AA−	AA−	
A1	A+	A+	Upper medium grade
A2	A	A	
A3	A−	A−	
Baa1	BBB+	BBB+	Lower medium grade
Baa2	BBB	BBB	
Baa3	BBB−	BBB−	
	DISTINCTLY SPECULATIVE—LOW CREDITWORTHINESS		
Ba1	BB+	BB+	Low grade, speculative
Ba2	BB	BB	
Ba3	BB−	BB−	
B1	B+	B+	Highly speculative
B2	B	B	
B3	B−	B−	
	PREDOMINANTLY SPECULATIVE—SUBSTANTIAL RISK OF DEFAULT		
	CCC+		
Caa	CCC	CCC	Substantial risk, in poor standing
	CCC−		
Ca	CC	CC	May be in default, extremely speculative
C	C	C	Even more speculative than those above
	C1		C1=Income bonds—no interest is being paid
		DDD	Default
		DD	
D	D		

Source: *Richard S. Wilson and Frank J. Fabozzi, Corporate Bonds: Structures & Analysis (New Hope, PA: Frank J. Fabozzi Associates, 1996).*

Ratings of bonds change over time. Issuers are upgraded when their likelihood of default as assessed by the rating company improves and downgraded when their likelihood of default as assessed by the rating company deteriorates. The rating companies publish the issues that they are reviewing for possible rating change. These lists are called *credit watch lists.*

Each rating agency periodically publishes a table showing the upgrade and downgrade history of the issues that it rated. Such a table is called a *rating transition matrix.* The table shows the percentage of issues of each rating at the beginning of a time period that were downgraded, upgraded, or unchanged by the end of some time period. This information

helps investors assess the prospects that an issue will be downgraded or upgraded over some time period.

Occasionally, the ability of an issuer to make interest and principal payments is seriously and unexpectedly changed by (1) a natural or industrial accident or some regulatory change, or (2) a takeover or corporate restructuring. These risks are referred to generically as *event risk*. Two examples of the first type of event risk are (1) a change in the accounting treatment of loan losses for commercial banks, and (2) the cancellation of nuclear plants by public utilities.

An example of the second type of event risk is the takeover in 1988 of RJR Nabisco for $25 billion through a financing technique known as a **leveraged buyout** (LBO). The new company took on a substantial amount of debt to finance the acquisition of the firm.[4] In the case of RJR Nabisco, the debt and equity after the leveraged buyout were $29.9 and $1.2 billion, respectively. Because of the need to service a larger amount of debt, the company's quality rating was reduced. RJR Nabisco's quality rating as assigned by Moody's dropped from A1 to B3. As a result, investors demanded a higher credit spread because of this new capital structure with a greater proportion of debt. The yield spread to a benchmark Treasury rate increased from about 100 basis points to 350 basis points.

Factors Considered by Rating Agencies

In assessing the credit risk of a corporate issuer, corporate bond issue, or corporate loan, the rating agencies generally look at three factors:

- the protections afforded to debt holders that are provided by covenants limiting management's discretion
- the collateral available for the debt holder should the issuer fail to make the required payments
- the ability of an issuer to make the contractual payments to debt holders

The indenture includes the covenants imposed on management. Covenants establish rules for several important areas of operation for corporate management. These provisions are safeguards for the debt holder. Indenture provisions are analyzed carefully in assigning a rating to a bond or loan.

In assessing the ability of an issuer to service its debt (i.e., make timely payment of interest and principal), one immediately thinks about the crunching of numbers based on the financial statements of the issuing corporation. While that is extremely important, the ability of an issuer to generate cash flow goes considerably beyond the calculation and analysis of a myriad of financial ratios and cash flow measures that can be used as a basic assessment of a company's financial risk. Analysts also look at qualitative factors such as the issuer's business risk and corporate governance risk to assess the issuer's ability to pay. Thus, the rating agencies look at business risk, corporate governance risk, and financial risk.

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[4] For a discussion of event risk associated with takeovers, see N.R. Vijayarghavan and Randy Snook, "Takeover Event Risk and Corporate Bond Portfolio Management," in Frank J. Fabozzi (ed.), *Advances and Innovations in Bond and Mortgage Markets* (Chicago: Probus Publishing, 1989).

Business risk is the risk associated with operating cash flows. Operating cash flows are not certain because the revenues and the expenditures comprising the cash flows are uncertain. Revenues depend on conditions in the economy as a whole and the industry in which the company operates, as well as the actions of management and its competitors. In assessing business risk, the three rating agencies look at the same general areas. S&P states that in analyzing business risk it considers country risk, industry characteristics, company position, product portfolio/marketing, technology, cost efficiency, strategic and operational management competence, and profitability/peer group comparisons.[5] Moody's investigates industry trends, national political and regulatory environment, management quality and attitude towards risk-taking, and basic operating and competitive position.[6] Fitch reviews industry trends, operating environment, market position, and management.[7]

Corporate governance issues involve (1) the ownership structure of the corporation, (2) the practices followed by management, and (3) policies for financial disclosure. The eagerness of corporate management to present favorable results to shareholders and the market has been a major factor in several of the corporate scandals in recent years and is what is referred to as **corporate governance risk**. Chief executive officers (CEOs), chief financial officers, and the board of directors are being held directly accountable for disclosures in financial statements and other corporate decisions. There are mechanisms that can mitigate the likelihood that management will act in its own self-interest. The mechanisms fall into two general categories. The first is to more strongly align the interests of management with those of shareholders. This can be accomplished by granting management an economically meaningful equity interest in the company. Also, manager compensation can be linked to the performance of the company's common stock. The second category of mechanism is by means of the company's internal corporate control systems, which can provide a way for effectively monitoring the performance and decision-making behavior of management.

In addition to corporate governance, rating agencies look at the quality of management in assessing a corporation's ability to pay. Moody's notes the following regarding the quality of management:

> Although difficult to quantify, management quality is one of the most important factors supporting an issuer's credit strength. When the unexpected occurs, it is a management's ability to react appropriately that will sustain the company's performance. Assessment of management's plans in comparison with those of their industry peers can also provide important insights into the company's ability to compete, how likely it is to use debt capacity, its treatment of its subsidiarie relationship with regulators, and its position vis-à-vis all fundamentals affectin company's long-term credit strength.[8]

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[5] Standard & Poor's Corporation, *Corporate Rating Criteria*, 2005, p. 20.
[6] Moody's Investors Service, *Industrial Company Rating Methodology*, July 1998, p. 3.
[7] FitchRatings, *Corporate Rating Methodology*, undated, pp. 1–2.
[8] Moody's Investors Service, *Industrial Company Rating Methodology*, p. 6.

In assessing management quality, Moody's tries to understand the business strategies and policies formulated by management. The factors Moody's considers are: (1) strategic direction, (2) financial philosophy, (3) conservatism, (4) track record, (5) succession planning, and (6) control systems.

Having achieved an understanding of a corporation's business risk and corporate governance risk, the rating agencies move on to assessing **financial risk**. This analysis involves traditional ratio analysis and other factors affecting the firm's financing. These measures, which are described in most books on investment management, involve interest coverage, leverage, cash flow, net assets, and working capital. Once these measures are calculated for the firm being analyzed, rating agencies compare them relative to other firms in the same industry.

Recovery Ratings

While credit ratings provide guidance for the probability of default and recovery given default, the market needed better recovery information for specific bond issues. In response to this need, two ratings agencies, Fitch and Standard & Poor's, developed **recovery rating systems** for corporate bonds. The recovery ratings were for secured debt. The S&P recovery ratings use an ordinal scale of one through five. Each recovery rating category corresponds to a specific range of recovery values.

Fitch introduced a recovery rating system for corporate bonds rated single B and below. The factors considered in assigning a recovery rating to an issue by Fitch are (1) the collateral, (2) the seniority relative to other obligations in the capital structure, and (3) the expected value of the issuer in distress. The recovery rating system does not attempt to precisely predict a given level of recovery. Rather, the ratings are in the form of an ordinal scale and referred to accordingly as a *recovery ratings scale.*

High-Yield Sector

As we have noted, high-yield bonds are issues with a credit rating below triple B. Bond issues in this sector of the market may have been rated investment grade at the time of issuance and have been downgraded subsequently to noninvestment grade, or they may have been rated noninvestment grade at the time of issuance, called *original-issue, high-yield bonds.* Bonds that have been downgraded fall into two groups: (1) issues that have been downgraded because the issuer voluntarily significantly increased their debt as a result of a leveraged buyout or a recapitalization, and (2) issues that have been downgraded for other reasons. The latter issues are commonly referred to as **fallen angels.**

The Role of High-Yield Bonds in Corporate Finance

The introduction of original-issue, high-yield bonds has been a very important financial innovation with wide impact throughout the financial system. There was a common view that high default risk bonds would not be attractive to the investing public, at least at interest rates that would be acceptable to the borrower. The view rested on the skewed nature of the outcomes offered by the instrument: The maximum return that an investor

may obtain is capped by the coupon and face value, but the loss could be as large as the principal invested. It was the merit of Drexel Burnham Lambert, and particularly of Michael Milken of that firm, to disprove that view as evidenced by the explosive growth of that market.

Before development of the high-yield market, U.S. corporations that could not issue securities in the public debt market would borrow from commercial banks or finance companies on a short-term to intermediate-term basis or would be shut off from credit. With the advent of the high-yield bond structure, financing shifted from commercial banks to the public market. One study estimated that about two-thirds of the $90 billion to $100 billion of the high-yield bonds issued represent simply a replacement of commercial bank borrowing. The same study concluded that high-yield bonds are "no more a threat to the stability of the financial system than that bank debt itself was."[9]

In essence, the high-yield bond market shifts the risk from commercial banks to the investing public in general. There are several advantages to such a shift. First, when commercial banks lend to high credit risk borrowers, that risk is accepted indirectly by all U.S. citizens, who may not wish to accept the risk. The reason is that commercial bank liabilities are backed by the Federal Deposit Insurance Company (FDIC). If high credit risk corporations default on their loans, causing an FDIC bailout, all taxpayers eventually may have to pay. The liabilities of other investors (excluding thrifts that have invested in high-yield bonds) are not backed by the U.S. government (and, therefore, not by U.S. citizens). The risks of this investing are accepted by the specific investor group willing to accept them.

The second advantage is that commercial bank loans are typically short-term, floating -rate loans, which make debt financing less attractive to corporations. High-yield bond issues give corporations the opportunity to issue long-term, fixed-rate debt. Third, commercial banks set interest rates based on their credit analysis. When high-yield bonds are traded in a public market, the investing public establishes the interest rate. Finally, the high-yield market opens the possibility of funding for some firms that previously had no means to it.

Corporate bond issuers use the proceeds from a bond sale for a number of purposes. These include working capital, expansion of facilities, refinancing of outstanding debt, and financing takeovers (mergers and acquisitions). In the case of noninvestment-grade bonds, it is the use of the proceeds to finance takeovers (particularly hostile takeovers) that has aroused some public concern over the excessive use of debt by U.S. corporations.[10]

High-Yield Bond Structures

In the early years of the high-yield market, all the issues had a conventional structure; that is, the issues paid a fixed coupon rate and were term bonds. Today, however, there are more

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[9] November 1986 speech by John Paulus, chief economist at Morgan Stanley, at a conference sponsored by Citizens for a Sound Economy.

[10] A hostile takeover is one in which the targeted firm's management resists the merger or acquisition.

complex bond structures in the junk bond area, particularly for bonds issued for LBO financing and recapitalizations producing higher debt.

In an LBO or a recapitalization, the heavy interest payment burden that the corporation assumes placed severe cash flow constraints on the firm. To reduce this burden, firms involved in LBOs and recapitalizations have issued bonds with deferred coupon structures that permit the issuer to avoid using cash to make interest payments for a period of three to seven years. There are three types of deferred coupon structures: (1) deferred-interest bonds, (2) step-up bonds, and (3) payment-in-kind bonds.

Deferred-interest bonds are the most common type of **deferred coupon structure.** These bonds sell at a deep discount and do not pay interest for an initial period, typically from three to seven years. (Because no interest is paid for the initial period, these bonds are sometimes referred to as zero-coupon bonds.) **Step-up bonds** do pay coupon interest, but the coupon rate is low for an initial period and then increases ("steps up") to a higher coupon rate. Finally, **payment-in-kind (PIK) bonds** give the issuer an option to pay cash at a coupon payment date or give the bondholder a similar bond (i.e., a bond with the same coupon rate and a par value equal to the amount of the coupon payment that would have been paid). The period during which the issuer can make this choice varies from five to 10 years.

Secondary Market

As with all bonds, the principal secondary market for corporate bonds is the over-the-counter market. The major concern is market transparency.

Trade Reporting and Compliance Engine

Efforts to increase price transparency in the U.S. corporate debt market resulted in the introduction in July 2002 by the National Association of Securities Dealers (NASD) of mandatory reporting of over-the-counter secondary market transactions for corporate bonds that met specific criteria. The reporting system, the **Trade Reporting and Compliance Engine (TRACE)**, requires that all broker-dealers who are NASD member firms report transactions in corporate bonds to TRACE.

When first introduced in July 2002, TRACE included only 500 U.S. investment-grade corporate bonds with an original issue size of $1 billion. Since then, the criteria for reporting transactions in TRACE resulted by October 2004 in 17,000 corporate bond issues being included, including most high-yield bonds. By February 2005, reporting criteria resulted in almost the entire corporate bond universe being included in TRACE (29,000 publicly traded issues).

At the end of each trading day, market aggregate statistics are published on corporate bond market activity. End-of-day recap information provided includes (1) the number of securities and total par amount traded; (2) advances, declines, and 52-week highs and lows; and (3) the 10 most active investment grade, high-yield, and convertible bonds for the day.

Electronic Bond Trading

Traditionally, corporate bond trading has been an OTC market conducted via telephone and based on broker-dealer trading desks, which take principal positions in corporate

bonds in order to fulfill the buy and sell orders of their customers. There has been a transition away from this traditional form of bond trading and toward electronic trading.[11]

Electronic bond trading makes up about 30% of corporate bond trading. The major advantages of electronic trading over traditional corporate bond trading in the over-the-counter market are (1) providing liquidity to the markets, (2) price discovery (particularly for less liquid markets), (3) use of new technologies, and (4) trading and portfolio management efficiencies.[12] As an example of the last advantage, a portfolio manager can load buy–sell orders on a website, trade from these orders, and then clear these orders.

There are five types of electronic corporate bond trading systems. **Auction systems** allow market participants to conduct electronic auctions of securities offerings for both new issues in the primary markets and secondary market offerings. Auction systems are not typically used. **Cross-matching systems** bring dealers and institutional investors together in electronic trading networks that provide real-time or periodic cross-matching sessions. Buy and sell orders are executed automatically when matched. **Interdealer systems** allow dealers to execute transactions electronically with other dealers via the anonymous services of "brokers' brokers." The clients of dealers are not involved in interdealer systems. **Multidealer systems** allow customers with consolidated orders from two or more dealers the ability to execute from among multiple quotes. Multidealer systems, also called client-**to-dealer systems**, typically display to customers the best bid or offer price of those posted by all dealers. The participating dealer usually acts as the principal in the transaction. **Single-dealer systems** permit investors to execute transactions directly with the specific dealer desired; this dealer acts as a principal in the transaction with access to the dealer by the investor, which increasingly has been through the Internet. Single-dealer systems therefore simply replace telephone contact between a single dealer and a customer with Internet contact.

Eurobond Market

The **Eurobond** sector of the global bond market includes bonds with several distinguishing features: (1) they are underwritten by an international syndicate, (2) at issuance they are offered simultaneously to investors in a number of countries, (3) they are issued outside the jurisdiction of any single country, and (4) they are in unregistered form. Although Eurobonds are typically listed on a national stock exchange (the most common are the Luxembourg, London, or Zurich exchanges), the bulk of all trading is in the over-the-counter market. Firms list these bonds purely to circumvent restrictions imposed on some institutional investors that are prohibited from purchasing securities not listed on an exchange. Some of the stronger issuers privately place their debt with international institutional investors.

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[11] For an explanation of the reasons for the transitions to electronic bond trading and why the trend is expected to continue, see Frank J. Jones and Frank J. Fabozzi, "The Primary and Secondary Bond Markets," *The Handbook of Fixed Income Securities*, 7th ed. (New York: McGraw Hill, 2005).

[12] Jones and Fabozzi, "The Primary and Secondary Bond Markets," p. 47.

Borrowers in the Eurobond market include nonfinancial corporations, banks, sovereign governments, entities whose debt is guaranteed by a sovereign government, provinces, municipalities, cities, and supranational entities such as the World Bank. The major issuer group is nonfinancial corporations, followed by banks. Traditionally, the main currency used in Eurobond offerings has been the U.S. dollar, although the share of Eurobond offerings denominated in U.S. dollars has been declining.

The Eurobond market has been characterized by new and innovative bond structures to accommodate particular needs of issuers and investors throughout the world. Some issues, of course, are the "plain vanilla," fixed-rate coupon bonds, referred to as **Euro straights.** Because they are issued on an unsecured basis, they are usually the debt of high-quality entities.

Coupon payments on Eurobonds are made annually, rather than semiannually. There are also zero-coupon bond issues, deferred-coupon issues, and step-up issues. Some of the innovative issues in this market are **dual-currency issues**: They pay coupon interest in one currency but the principal in a different currency. For example, the coupon interest payments can be made in Swiss francs, while the principal may be paid in U.S. dollars.

Some Eurobonds are convertible or exchangeable, and bonds with attached warrants represent a large part of the market. Most warrants on Eurobonds are detachable from the bond with which they originally came to market. That is, the bondholder may detach the warrant from the bond and sell it separately.

The warrants on Eurobonds are varied: Some are equity warrants, others are debt warrants, and still others may be currency warrants. An equity warrant permits the warrant owner to buy the common stock of the issuer at a specified price. A debt warrant entitles the warrant owner to buy additional bonds from the issuer at the same price and yield as the host bond. The debt warrant owner will benefit if interest rates decline because the warrant allows the owner to purchase a bond with a higher coupon than the same issuer would offer. A currency warrant permits the warrant owner to exchange one currency for another at a set price (that is, a fixed exchange rate). This feature protects the bondholder against a depreciation of the foreign currency in which the bond's cash flows are denominated. Finally, we also note that some warrants are gold warrants and allow the warrant holder to purchase gold from the bond issuer at a prespecified price.

Eurobonds make use of a wide variety of floating-rate structures. Almost all the floating-rate notes are denominated in U.S. dollars, and non–U.S. banks are the major issuers of these bonds. The coupon rate on a floating-rate note is some stated margin over the London Interbank Offered Rate (LIBOR), the bid on LIBOR (referred to as LIBID), or the arithmetic average of LIBOR and LIBID (referred to as LIMEAN). Many floating-rate issues have either a minimum rate (or floor) that the coupon rate cannot fall below or a maximum rate (or cap) that the coupon rate cannot exceed. An issue that has both a floor and a cap is said to be *collared.* Some floating-rate issues grant the borrower the right to convert the floating coupon rate into a fixed coupon rate at some time. Some issues, referred to as *drop-lock bonds*, automatically convert the floating coupon rate into a fixed coupon rate under certain circumstances.

. Fabozzi 4th-29(R)

Key Points That You Should Understand Before Proceeding

1. The bond indenture sets forth the obligations of the issuer and the rights of the bondholders.
2. Either real property or personal property may be pledged to offer security beyond that of the general credit standing of the issuer.
3. Bonds typically carry provisions that allow for the principal to be repaid prior to the stated maturity date, with the most common provision being the right of the issuer to call the issue. This is an advantage to the issuer and a disadvantage to the bondholder.
4. There is a wide variety of bond structures with special features that make issues more attractive to both borrowers and investors.
5. In addition to credit risk, corporate bond investors are exposed to event risk.
6. High-yield bonds are issues whose quality rating is designated as noninvestment grade, and there are several unique bond structures in this sector of the market.
7. The Eurobond market has been characterized by new and innovative bond structures to accommodate particular needs of issuers and investors throughout the world.

PREFERRED STOCK

Preferred stock is a class of stock, not a debt instrument, but it shares characteristics of both common stock and debt. Like the holder of common stock, the preferred stockholder is entitled to dividends. Unlike those on common stock, however, preferred dividends are a specified percentage of par or face value.[13] The percentage is called the dividend rate; it need not be fixed, but may float over the life of the issue.

Failure to make preferred stock dividend payments cannot force the issuer into bankruptcy. Should the issuer not make the preferred stock dividend payment, usually paid quarterly, one of two things can happen, depending on the terms of the issue. First, the dividend payment can accrue until it is fully paid. Preferred stock with this feature is called **cumulative preferred stock.** If a dividend payment is missed and the securityholder must forgo the payment, the preferred stock is said to be **noncumulative preferred stock.** Second, the failure to make dividend payments may result in the imposition of certain restrictions on management. For example, if dividend payments are in arrears, preferred stockholders might be granted voting rights.

Preferred stock differs from debt in a major way: The current tax code for corporations treats payments made to preferred stockholders as a distribution of earnings and not as tax-deductible expenses, which is how the tax code views interest payments. While this difference in tax status raises the after-tax cost of funds for a corporation issuing preferred stock rather than borrowing, another factor in the tax code reduces the cost differential. A provision in the tax code exempts 70% of qualified dividends from federal income taxation, if the recipient is a qualified corporation.

For example, if Corporation A owns the preferred stock of Corporation B, then only $30 of each $100 that A receives in dividends from B will be taxed at A's marginal tax rate. The purpose of this provision is to mitigate the effect of the double taxation of corporate

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[13] Almost all preferred stock limits the securityholder to the specified amount. Historically, there have been issues entitling the preferred stockholder to participate in earnings distribution beyond the specified amount (based on some formula). Preferred stock with this feature is referred to as participating preferred stock.

earnings. There are two implications of this tax treatment of preferred stock dividends. First, the major buyers of preferred stock are corporations seeking tax-advantaged investments. Second, the cost of preferred stock issuance is lower than it would be in the absence of the tax provision, because the tax benefits are passed through to the issuer by the willingness of buyers to accept a lower dividend rate.

Preferred stock, particularly cumulative preferred stock, has some important similarities with debt: (1) The issuer promises fixed cash payments to preferred stockholders, and (2) preferred stockholders have priority over common stockholders with respect to dividend payments and the distribution of assets in the case of bankruptcy. (The position of noncumulative preferred stock is considerably weaker.) It is because of this second feature that preferred stock is called a senior corporate instrument—it is senior to common stock. Note, however, that preferred stock is classified as equity on corporate balance sheets.

Almost all preferred stock has a sinking fund provision, and some preferred stock is convertible into common stock. Preferred stock may be issued without a maturity date. This is called **perpetual preferred stock.**

The preferred stock is a relatively small part of the financial system. Historically, utilities have been the major issuers of preferred stock, accounting for more than half of each year's issuance. Since 1985, major issuers have become financially oriented companies—finance companies, banks, thrifts, and insurance companies.

The same four commercial companies that assign ratings to corporate bond issues also rate preferred stock issues.

There are three types of preferred stock: (1) fixed-rate preferred stock, (2) adjustable-rate preferred stock, and (3) auction and remarketed preferred stock. Before 1982, all publicly issued preferred stock was fixed-rate preferred stock. In May 1982, the first adjustable-rate preferred stock issue was sold in the public market.[14]

Adjustable-Rate Preferred Stock

The dividend rate on an **adjustable-rate preferred stock (ARPS)** is fixed quarterly and based on a predetermined spread from the highest of three points on the Treasury yield curve.[15] The predetermined spread is called the *dividend reset spread.* The motivation for linking the dividend rate to the highest of the three points on the Treasury yield curve is to provide the investor with protection against unfavorable shifts in the yield curve.

Most ARPS is perpetual, with a floor and ceiling imposed on the dividend rate of most issues. Because an ARP is typically not putable, it can trade below par if, after issuance, the

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[14] Private placement of ARPS occurred as early as 1978—illustrating how an innovation is first developed in this market. For historical background on the development of the ARPS market, see Richard S. Wilson, "Adjustable Rate Preferred Stocks," Chapter 3 in Frank J. Fabozzi (ed.), *Floating Rate Instruments: Characteristics, Valuation and Portfolio Strategies* (Chicago: Probus Publishing, 1986).

[15] The three points on the yield curve (called the benchmark rate) to which the dividend reset spread is either added or subtracted are the highest of: (1) the three-month Treasury bill rate, (2) the two-year constant maturity rate, or (3) a 10-year or 30-year constant maturity rate. The Treasury constant maturity rate is reported in the Federal Reserve Report H.15(519). It is based on the closing market bid yields on actively traded Treasury securities.

spread demanded by the market to reflect the issuer's credit risk is greater than the dividend reset spread.

The major issuers of ARPS have been bank holding companies. There are two reasons bank holding companies have become major issuers of ARPS. First, floating-rate obligations provide a better liability match, given the floating-rate nature of bank assets. Second, bank holding companies are seeking to strengthen their capital positions, and regulators permit bank holding companies to count perpetual preferred stock as part of their primary capital. Issuing ARPS provides not only a better asset/liability match, but also permits bank holding companies to improve primary capital without having to issue common stock.

Auction and Remarketed Preferred Stock

The popularity of ARPS declined when instruments began to trade below their par value—because the dividend reset rate is determined at the time of issuance, not by market forces. In 1984, a new type of preferred stock, **auction preferred stock** (APS), was designed to overcome this problem, particularly for corporate treasurers who sought tax-advantaged short-term instruments to invest excess funds.[16] The dividend rate on APS is set periodically, as with ARPS, but it is established through an auction process.[17] Participants in the auction consist of current holders and potential buyers. The dividend rate that participants are willing to accept reflects current market conditions.

In the case of **remarketed preferred stock (RP)**, the dividend rate is determined periodically by a remarketing agent who resets the dividend rate so that any preferred stock can be tendered at par and be resold (remarketed) at the original offering price. An investor has the choice of dividend resets every seven days or every 49 days.

Since 1985, APS and RP have become the dominant types of preferred stock issued.

Key Points That You Should Understand Before Proceeding

1. Preferred stock is a class of stock in which the dividend rate is typically a fixed percentage of par or face value.
2. Payments made to preferred stockholders are treated as a distribution of earnings and therefore are not tax deductible to the issuing corporation.
3. Because the tax code exempts 70% of qualified dividends from federal income taxation if the recipient is a qualified corporation, the major buyers of preferred stock are corporations seeking tax-advantaged investments; these investors are willing to accept a lower dividend rate.
4. Preferred stock has some important similarities with debt.
5. There are various types of preferred stock: fixed-rate, adjustable-rate, auction, and remarketed preferred stock.

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[16] Each investment bank developed its own trademark name for APS. The instrument developed by Shearson Lehman/American Express was called Money Market Preferred (MMP). Salomon Brothers called it Dutch Auction Rate Transferable Securities (DARTS).

[17] The auction process is described in Richard S. Wilson, "Money Market Preferred Stock," Chapter 4 in Frank J. Fabozzi (ed.), *Floating Rate Instruments*, pp. 85–88.

BANKRUPTCY AND CREDITOR RIGHTS

In this chapter, we refer to *senior* corporate securities. By senior, we mean that the holder of the security has priority over the equity owners in the case of the bankruptcy of a corporation. And, as we explain in this chapter, there are creditors who have priority over other creditors. In this section, we provide an overview of the bankruptcy process and then look at what actually happens to creditors in bankruptcies.

The U.S. bankruptcy law gives debtors who are unable to meet their debt obligations a mechanism for formulating a plan to resolve their debts through an allocation of their assets among their creditors.[18] One purpose of the bankruptcy law is to set forth the rules for a corporation to be liquidated or reorganized. *Liquidation* means that all the assets of the corporation will be distributed to holders of claims on the corporation, and no corporate entity will survive. In a *reorganization*, a new corporate entity will result. Some holders of claims on the bankrupt corporation will receive cash in exchange for their claims; others may receive new securities in the corporation that results from the reorganization; and still others may receive a combination of both cash and new securities in the resulting corporation.

Another purpose of the bankruptcy act is to give a corporation time to decide whether to reorganize or to liquidate, and then provide the necessary time to formulate a plan to accomplish either a reorganization or liquidation. This is achieved because a bankruptcy filing allows the corporation protection from creditors who seek to collect their claims.[19] A company that files for protection under the bankruptcy act generally becomes a **debtor-in-possession**, and continues to operate its business under the supervision of the court.

The bankruptcy act has 15 chapters, each covering a particular type of bankruptcy. Of particular interest to us are two of the chapters, **Chapter 7** and **Chapter 11**. Chapter 7 deals with the liquidation of a company; Chapter 11 covers reorganization.

When a company is liquidated, creditors receive distributions based on the **absolute priority rule** to the extent assets are available. The absolute priority rule is the principle that senior creditors are paid in full before junior creditors are paid anything. For secured creditors and unsecured creditors, the absolute priority rule guarantees their seniority to equity holders.

In liquidations, the absolute priority rule generally holds, but in reorganizations under Chapter 11, it is often violated. Studies of actual reorganizations under Chapter 11 have found that the violation of absolute priority is the rule rather than the exception.[20]

There are several reasons that have been suggested as to why, in a reorganization, the distribution made to claimholders will diverge from that required by the absolute priority principle.[21] One reason commonly cited has to do with the negotiation process that takes

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[18] Congress passed the Bankruptcy Code under its Constitutional grant of authority to "establish . . . uniform laws on the subject of Bankruptcy throughout the United States." The U.S. Bankruptcy Courts are responsible for the supervising and litigating bankruptcy proceedings.

[19] The petition for bankruptcy can be filed either by the company itself, in which case it is called a *voluntary bankruptcy*, or be filed by its creditors, in which case it is called an *involuntary bankruptcy*.

[20] See Julian R. Franks and Walter N. Torous, "An Empirical Investigation of U.S. Firms in Reorganization," *Journal of Finance* (July 1989), pp. 747–769; Lawrence A. Weiss, "Bankruptcy Resolution: Direct Costs and Violation of Priority of Claims," *Journal of Financial Economics* (1990), pp. 285–314; and Frank J. Fabozzi, Jane Tripp Howe, Takashi Makabe, and Toshihide Sudo, "Recent Evidence on the Distribution Patterns in Chapter 11 Reorganizations," *Journal of Fixed Income* (Spring 1993), pp. 6–23.

[21] For a discussion of these reasons, see Fabozzi, et. al., "Recent Evidence on the Distribution Patterns in Chapter 11 Reorganizations," op. cit.

place among the various classes of claimholders in a reorganization. In a reorganization, a committee representing the various claimholders is appointed with the purpose of formulating a plan of reorganization. To be accepted, a plan of reorganization must be approved by at least two-thirds of the amount and a majority of the number of claims voting, and at least two-thirds of the outstanding shares of each class of interests. Consequently, a long-lasting bargaining process is expected. The longer the negotiation process among the parties, the more likely the company is to be operated in a manner that is not in the best interest of the creditors and, as a result, the smaller the amount to be distributed to all parties. Since all impaired classes including equityholders generally must approve the plan of reorganization, creditors often convince equityholders to accept the plan by offering to distribute some value to them.

Consequently, while investors in the debt of a corporation may feel that they have priority over the equity owners and priority over other classes of debtors, the actual outcome of a bankruptcy may be far different from what the terms of the debt agreement state.

Key Points That You Should Understand Before Proceeding

1. Bankruptcy law is a federal statutory law that provides for the development of a plan allowing debtors who are not able to pay their creditors to resolve their debts through the division of their assets among their creditors.
2. Chapter 7 of the act deals with the liquidation of a company, and Chapter 11 deals with the reorganization of a company.
3. When a company is liquidated, creditors receive distributions based on the absolute priority rule to the extent assets are available.
4. In liquidations, the absolute priority rule generally holds, but in reorganizations under Chapter 11, it is often violated.

SUMMARY

Corporate bonds are debt obligating a corporation to pay periodic interest with full repayment at maturity. The promises of the corporate bond issuer and the rights of the investors are set forth in the bond indenture. Provisions to be specified include call and sinking fund provisions.

Security for bonds may be real or personal property. Debenture bonds are not secured by a specific pledge of property. Subordinated debenture bonds are issues that rank after secured debt, after debenture bonds, and often after some general creditors in their claims on assets and earnings.

The credit risk of a corporate borrower can be gauged by the credit rating assigned by the three nationally recognized rating companies. Issues rated in the top ratings of the three raters are referred to as investment-grade bonds; those below the top four ratings are called noninvestment-grade bonds, high-yield bonds, or junk bonds. In assigning a credit rating, the credit rate companies assess the protections set forth in the bond indenture, the collateral available for the debt holders should the issuer fail to make the required payments, and the capacity of an issuer to fulfill its payment obligations. In assessing the ability of an issuer to service its debt, rating agencies assess the issuer's business risk, corporate governance risk, and financial risk. Business risk is the risk associated with operating cash flows. In assessing business risk, some of the main factors considered are industry characteristics and trends,

the company's market and competitive positions, management characteristics, and the national political and regulatory environment. Corporate governance risk involves assessing (1) the ownership structure of the corporation, (2) the practices followed by management, and (3) policies for financial disclosure. Assessing financial risk involves traditional ratio analysis and other factors affecting the firm's financing. The more important financial ratios analyzed are interest coverage, leverage, cash flow, net assets, and working capital.

Secondary trading information for corporate bonds is provided by TRACE. There are the following five types of electronic corporate bond trading systems: auction systems, cross-matching systems, interdealer systems, multidealer systems, and single-dealer systems.

Special corporate bond features include convertible and exchangeable bonds, units of debt with warrants, putable bonds, zero-coupon bonds, and floating-rate securities. Junk bonds or high-yield bonds are issues with quality ratings below triple B. Recent years have seen the introduction of several complex bond structures in the junk bond area, particularly bonds issued for LBO financing and recapitalizations producing higher levels of debt to equity. These include deferred-coupon bonds (deferred-interest bonds, step-up bonds, and payment-in-kind bonds) and extendable reset bonds.

Many innovative bond structures have been introduced in the Eurobond market such as dual-currency issues and various types of convertible bonds and bonds with warrants. A warrant permits its owner to enter into another financial transaction with the issuer if the owner will benefit by doing so. The floating-rate sector of the Eurobond market is dominated by U.S. dollar-denominated issues.

Preferred stock as a class of stock has characteristics of both common stock and debt. Because a special provision in the tax code allows taxation of only a portion of dividends when they are received by a corporation, the major buyers of preferred stock are corporations. There are three types of preferred stock besides the traditional fixed-rate preferred stock: adjustable-rate preferred stock, auction preferred stock, and remarketed preferred stock.

The bankruptcy law governs the bankruptcy process in the United States. Chapter 7 of the bankruptcy act deals with the liquidation of a company. Chapter 11 deals with the reorganization of a company. Creditors receive distributions based on the absolute priority rule to the extent assets are available. This means that senior creditors are paid in full before junior creditors are paid anything. Generally, this rule holds in the case of liquidations. In contrast, the absolute priority rule is typically violated in a reorganization.

KEY TERMS

- Absolute priority rule
- Adjustable-rate preferred stock (ARPS)
- Auction preferred stock (APS)
- Auction systems
- Bond indenture
- Bullet-maturity (bullet) bond
- Business risk
- Call risk (timing risk)
- Chapter 7
- Chapter 11
- Client-to-dealer system
- Collateral trust bond
- Convertible bond
- Corporate governance risk
- Cross-matching systems
- Cumulative preferred stock
- Debenture bond
- Debtor-in-possession

- Deferred coupon structure
- Deferred-interest bond
- Dual-currency issue
- Equipment trust certificate
- Euro straights
- Eurobond
- Exchangeable bond
- Fallen angel
- Financial risk
- Floating-rate security
- Guaranteed bond
- High-yield bond (junk bond)
- Interdealer systems
- Investment-grade bond
- Leveraged buyout (LBO)
- Mortgage bond
- Multidealer systems
- Noncumulative preferred stock
- Payment-in-kind (PIK) bond
- Perpetual preferred stock
- Preferred stock
- Putable bond
- Recovery rating systems
- Refunding
- Remarketed preferred stock (RP)
- Serial bond
- Single-dealer systems
- Sinking fund provision
- Step-up bond
- Subordinated debenture bond
- Trade Reporting and Compliance Engine (TRACE)
- Warrant

QUESTIONS

1. a. What are the disadvantages of investing in a callable bond?
   b. What is the advantage to the issuer of issuing a callable bond?
   c. What is the difference between a noncallable bond and a nonrefundable bond?
2. a. What is a sinking fund requirement in a bond issue?
   b. "A sinking fund provision in a bond issue benefits the investor." Do you agree with this statement?
3. What is a
   a. serial bond?
   b. mortgage bond?
   c. equipment trust certificate?
   d. collateral bond?
4. What is the difference between a convertible bond and an exchangeable bond?
5. Do you agree or disagree with this statement: "Zero-coupon corporate bonds are created in the same way as in the Treasury market—by stripping coupon bonds"?
6. a. What is event risk?
   b. Give two examples of event risk.
7. What is meant by a rating transition matrix?
8. In assigning a credit rating, the credit rating companies analyze a company's business risk. What is meant by business risk?
9. a. What is meant by corporate governance risk?
   b. What are two mechanisms for mitigating corporate governance risk?
10. How does a credit rating differ from a recovery rating?
11. What are the major advantages of electronic trading over traditional corporate bond trading in the over-the-counter market?
12. What is the difference between a fallen angel and an original-issue, high-yield bond?
13. Indicate why you agree or disagree with the following statement: "Today, the proceeds from most original-issue, high-yield bonds are used for leveraged buyouts and recapitalizations."
14. a. What is a Eurobond?
    b. How often is the coupon payment on a Eurobond made?
    c. Name the two currencies most often used to denominate Eurobonds.
15. What is a dual-currency bond?

16. a. Explain what an institutional investor will do to purchase or sell a corporate bond.
    b. What has happened to the commitment of capital of dealer firms to the high-yield corporate bond market in recent years?
17. a. Why are corporate treasurers the main buyers of preferred stock?
    b. What is the reason for the popularity of auction and remarketed preferred stock?
18. a. What is the difference between a liquidation and a reorganization?
    b. What is the difference between a Chapter 7 and Chapter 11 bankruptcy filing?
    c. What is meant by a debtor-in-possession?
19. a. What is meant by the principle of absolute priority?
    b. Comment on this statement: "An investor who purchases the mortgage bonds of a corporation knows that, should the corporation become bankrupt, mortgage bondholders will be paid in full before the common stockholders receive any proceeds."



The Markets for Bank Obligations

LEARNING OBJECTIVES

After reading this chapter, you will understand

- a categorization of banks that is useful for understanding the supply of bank obligations
- what a negotiable certificate of deposit or CD is, and the different types of certificates of deposit
- what a Euro CD is and how it differs from a Yankee CD
- what determines a CD's yield or rate of interest
- what federal funds are, and how banks use them to meet Federal Reserve requirements
- what the effective fed funds rate is
- the size of the fed funds market and the role brokers play in it
- what a bankers acceptance is, and how it is created
- what the bankers acceptance's credit risk is, and what an eligible bankers acceptance is

Commercial banks are special types of corporations. Larger banks will raise funds using the various debt markets described in the previous two chapters. In this chapter, we describe three other debt obligations: large-denomination certificates of deposit, federal funds, and **bankers acceptances**. All these instruments trade in what is collectively known as the *money market*, the market for short-term debt instruments. Typically, money market instruments have a maturity of one year or less. While our discussion focuses on commercial banks, other depository institutions may also issue the same types of obligations.

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TYPES OF BANKS OPERATING IN THE UNITED STATES

Banks in the United States can be classified into four groups. First are the **money center banks**—banks that raise most of their funds from the domestic and international money markets and rely less on depositors for funds. The second group is **regional banks**, which rely primarily on deposits for funding and make less use of the money markets to obtain funds. **Japanese banks** are the third group of banks. The fourth group of banks are **Yankee banks.** These are foreign banks with U.S. branches. Included in this group are non-Japanese branches of foreign banks, such as Credit Lyonnais and Deutsche Bank.

LARGE-DENOMINATION NEGOTIABLE CERTIFICATES OF DEPOSIT

A **certificate of deposit** (CD) is a financial asset issued by a bank or thrift that indicates a specified sum of money has been deposited at the issuing depository institution. CDs are issued by banks and thrifts to raise funds for financing their business activities. A CD bears a maturity date and a specified interest rate, and can be issued in any denomination. CDs issued by banks are insured by the Federal Deposit Insurance Corporation but only for amounts up to $100,000 (for qualified retirement accounts the insured amount is $250,000). This was temporarily increased through December 29, 2009, to $250,000 for regular accounts and $500,000 for qualified retirement accounts. There is no limit on the maximum maturity, but by Federal Reserve regulations CDs cannot have a maturity of less than seven days.

A CD may be *nonnegotiable* or **negotiable.** In the former case, the initial depositor must wait until the maturity date of the CD to obtain the funds. If the depositor chooses to withdraw funds prior to the maturity date, an early withdrawal penalty is imposed. In contrast, a negotiable CD allows the initial depositor (or any subsequent owner of the CD) to sell the CD in the open market prior to the maturity date.

Negotiable CDs were introduced in the early sixties. At that time the interest rate banks could pay on various types of deposits was subject to ceilings administered by the Federal Reserve (except for demand deposits defined as deposits of less than one month that by law could pay no interest). For complex historical reasons, these ceiling rates started very low, rose with maturity, and remained below market rates up to some fairly long maturity. Before introduction of the negotiable CD, those with money to invest for, say, one month had no incentive to deposit it with a bank, for they would get a below-market rate unless they were prepared to tie up their capital for a much longer period of time. When negotiable CDs came along, they could buy a three-month or longer negotiable CD yielding a market interest rate, and recoup all or more than the investment (depending on market conditions) by selling it in the market.

This innovation was critical in helping banks to increase the amount of funds raised in the money market, a position that had languished in the earlier postwar period. It also motivated competition among banks, ushering in a new era. There are now two types of negotiable CDs. The first is the large-denomination CD, usually issued in denominations of $1 million or more. These are the negotiable CDs whose history we previously described.

In 1982, Merrill Lynch entered the retail CD business by opening up a primary and secondary market in small-denomination (less than $100,000) CDs. While it made the CDs of its numerous banking and savings institution clients available to retail customers, Merrill Lynch also began to give these customers the negotiability enjoyed by institutional investors by standing ready to buy back the CDs prior to maturity. Today, several retail-oriented brokerage firms offer CDs that are salable in a secondary market. These are the second type of negotiable CD. Our focus in this chapter, though, is on the large-denomination negotiable CD, and we refer to them simply as CDs throughout the chapter.

CD Issuers

CDs can be classified into four types, according to the issuing institution. First are CDs issued by domestic banks. Second are CDs that are denominated in U.S. dollars but are issued outside the United States. These CDs are called **Eurodollar CDs.** A third type of CD is the **Yankee CD**, which is a CD denominated in U.S. dollars and issued by a foreign bank with a branch in the United States. Finally, **thrift CDs** are those issued by savings and loan associations and savings banks.

Money center banks and large regional banks are the primary issuers of domestic CDs. Most CDs are issued with a maturity of less than one year. Those issued with a maturity greater than one year are called **term CDs.**

Unlike Treasury bills, commercial paper, and bankers acceptances, yields on domestic CDs are quoted on an interest-bearing basis. CDs with a maturity of one year or less pay interest at maturity. For purposes of calculating interest, a year is treated as having 360 days. Term CDs issued in the United States normally pay interest semiannually, again with a year taken as 360 days.

A floating-rate CD (FRCD) is one whose interest rate changes periodically in accordance with a predetermined formula that indicates the spread (or margin) above some index at which the rate will reset periodically. There are FRCDs that reset the coupon daily, weekly, monthly, quarterly, or semiannually. Typically FRCDs have maturities from 18 months to five years.

Eurodollar CDs are U.S. dollar–denominated CDs issued primarily in London by U.S., European, Canadian, and Japanese banks. The yields on Eurodollar CDs play an important role in the world financial markets because they are viewed globally as the cost of bank borrowing, since they are effectively the rates at which major international banks offer to pay each other to borrow money by issuing a Eurodollar (CD) with given maturities. The interest rate paid is called the **London interbank offered rate (LIBOR).**

Yields on Certificates of Deposit

The yields posted on CDs vary depending on three factors: (1) the credit rating of the issuing bank, (2) the maturity of the CD, and (3) the supply and demand for CDs. With respect to the third factor, banks and thrifts issue CDs as part of their liability management strategy, so the supply of CDs will be driven by the demand for bank loans and the cost of alternative sources of capital to fund these loans. Moreover, bank loan demand will depend on the cost of alternative funding sources such as commercial paper. When loan demand is weak, CD rates decline. When demand is strong, the rates rise. The effect of maturity depends on the shape of the yield curve.

Credit risk has become more of an issue. At one time, domestic CDs issued by money center banks traded on a *no-name basis*. Recent financial crises in the banking industry, however, have caused investors to take a closer look at issuing banks. **Prime CDs** (those issued by high-rated domestic banks) trade at a lower yield than **nonprime CDs** (those issued by lower-rated domestic banks). Because of the unfamiliarity investors have with foreign banks, generally Yankee CDs trade at a higher yield than domestic CDs.

As just noted, the rate or yield offered on Eurodollar CDs is LIBOR. This yield is higher than the yield on domestic CDs. There are three reasons for this. First, there are reserve requirements imposed by the Federal Reserve on CDs issued by U.S. banks in the United States that do not apply to issuers of Eurodollar CDs. The reserve requirement effectively raises the cost of funds to the issuing bank because it cannot invest all the proceeds it receives from the issuance of a CD, and the amount that must be kept as reserves will not earn a return for the bank. Because it will earn less on funds raised by selling domestic CDs, the domestic issuing bank will pay less on its domestic CD than a Eurodollar CD. Second, the bank issuing the CD must pay an insurance premium to the FDIC, which again raises the cost of funds. Finally, Eurodollar CDs are dollar obligations that are payable by an entity operating under a foreign jurisdiction, exposing the holders to a risk (referred to as sovereign risk) that their claim may not be enforced by the foreign jurisdiction. As a result, a portion of the spread between the yield offered on Eurodollar CDs and domestic CDs reflects what can be termed a sovereign risk premium. This premium varies with the degree of confidence in the international banking system.

The maturities for the Eurodollar CD range from overnight to five years. So, references to "three-month LIBOR" indicate the interest rate that major international banks are offering to pay to other such banks on a CD that matures in three months. During the 1990s, LIBOR increasingly became the reference rate of choice for borrowing arrangements—loans and floating-rate securities. When we discuss derivatives instruments used to control interest rate risk, we will see that the reference rate for many of them (particularly interest rate swaps) is LIBOR.

CD yields are higher than yields on Treasury securities of the same maturity. The spread is due mainly to the credit risk that a CD investor is exposed to and the fact that CDs offer less liquidity. The spread due to credit risk will vary with both economic conditions and confidence in the banking system, increasing when there is a "flight to quality" (which means investors shift their funds in significant amounts to debt of high quality or little risk), or when there is a crisis in the banking system.

At one time, there were more than 30 dealers who made markets in CDs. The presence of that many dealers provided good liquidity to the market. Today, fewer dealers are interested in making markets in CDs, and the market can be characterized as an illiquid one.

Key Points That You Should Understand Before Proceeding

1. A negotiable CD allows the initial depositor (or any subsequent owner of the CD) to sell the CD in the open market prior to the maturity date.
2. CDs can be classified into four types, based on the issuing entity: domestic CD, Eurodollar CD, Yankee CD, and thrift CD.
3. The yield offered on a CD depends on the credit rating of the issuing bank, the maturity of the CD, and the supply and demand for CDs.
4. CD yields are higher than yields on Treasury securities of the same maturity.
5. The important role played by the Eurodollar CD and the rate paid, LIBOR.

FEDERAL FUNDS

The rate determined in the federal funds market is the major factor that influences the rates paid on all the other money market instruments described in this chapter. Depository institutions (commercial banks and thrifts) are required to maintain reserves. The reserves are deposits at their district Federal Reserve Bank, which are called *federal funds*. The level of the reserves that a bank must maintain is based on its average daily deposits over the previous 14 days. Of all depository institutions, commercial banks are by far the largest holders of federal funds.

No interest is earned on federal funds. Consequently, a depository institution that maintains federal funds in excess of the amount required incurs an opportunity cost—the loss of interest income that could be earned on the excess reserves. At the same time, there are depository institutions whose federal funds are less than the amount required. Typically, smaller banks have excess reserves, while money center banks find themselves short of reserves and must make up the shortfall. Banks maintain federal funds desks whose managers are responsible for the bank's federal funds position.

Most transactions involving fed funds last for only one night; that is, a bank with insufficient reserves that borrows excess reserves from another financial institution will typically do so for the period of one full day. Because these loans last for such a short time, fed funds are often referred to as *overnight money*.

One way that banks with less than the required reserves can bring reserves to the required level is to enter into a repurchase agreement (or *repo*) with a nonbank customer. The repo, which consists of the sale of a security and an agreement by the bank to repurchase it later, will provide funds for a short period of time, after which the bank buys back the security, as previously agreed. An alternative to the repo is for the bank to borrow federal funds from a bank that has excess reserves. The market in which federal funds are bought (borrowed) by banks that need these funds and sold (lent) by banks that have excess federal funds is called the federal funds market. The equilibrium interest rate, which is determined by the supply and demand for federal funds, is the federal funds rate.

Federal Funds Rate

The federal funds rate and the repo rate are tied together because both are a means for a bank to borrow. The federal funds rate is higher because the lending of federal funds is done on an unsecured basis; this differs from the repo, where the lender has a security as collateral. The spread between the two rates varies depending on market conditions; typically the spread is around 25 basis points.

The rate most often cited for the fed funds market is known as the **effective fed funds rate**. The *Federal Reserve Bulletin* defines "the daily effective rate" as "a weighted average of rates on trades through N.Y. brokers." This weighting process, which takes the size of transactions into account, can be illustrated in an example. Suppose only two transactions took place on September 1, one for $50 million at 3.375% and another for $150 million at 3.625%. The simple arithmetic average of this day's rates would be (3.375% + 3.625%)/2, or 3.5%. By contrast, the transactions-weighted average for that day is (50/200)(3.375%) + (150/200)(3.625%), or 3.5625%. The weighted average exceeds the arithmetic average because the larger transaction occurred at the higher interest rate.

The fed funds rate is frequently a significant operating target of the Federal Reserve Board's monetary policy. Through its open market operations that lower or raise the level of excess reserves in the banking system, the Fed will often change the fed funds rate as part of its effort to change the rate of activity in the country's economy. For this reason, the fed funds rate often shows a high level of volatility over short periods of time. Although this rate does generally tend to move in the direction of other money market rates, the fed funds rate often is the first of these rates to change, and frequently it changes more substantially than the other money market rates.

Market for Federal Funds

Although the term of most federal funds transactions is overnight, there are longer-term transactions that range from one week to six months. Trading typically takes place directly between the buyer and seller—usually between a large bank and one of its correspondent banks. Some federal funds transactions require the use of a broker. The broker stays in constant touch with likely buyers and sellers of funds and arranges deals between them for a commission. Brokers provide another service to this market in (normally) unsecured loans because they often can give lenders credit analyses of borrowers if the lenders have not done business with them previously.[1]

Key Points That You Should Understand Before Proceeding

1. The rate determined in the federal funds market is the major factor that influences the rate paid on all other private money market instruments.
2. Commercial banks are by far the largest holders of federal funds, with most transactions involving fed funds lasting for only one night.
3. Borrowing in the federal funds market is an alternative to borrowing in the repo market.
4. The federal funds rate is higher than the repo rate because the lending of federal funds is done on an unsecured basis.
5. The effective fed funds rate is the rate most often cited for the fed funds market.

BANKERS ACCEPTANCES

Simply put, a bankers acceptance is a vehicle created to facilitate commercial trade transactions. The instrument is called a bankers acceptance because a bank accepts the ultimate responsibility to repay a loan to its holder. The use of bankers acceptances to finance a commercial transaction is referred to as acceptance financing.

The transactions in which bankers acceptances are created include (1) the importing of goods into the United States, (2) the exporting of goods from the United States to foreign entities, (3) the storing and shipping of goods between two foreign countries where neither the importer nor the exporter is a U.S. firm,[2] and (4) the storing and shipping of goods between two entities in the United States.

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[1] Marvin Goodfriend, "Federal Funds," in *Instruments of the Money Market*, Federal Reserve Bank of Richmond, 1993.

[2] Bankers acceptances created from these transactions are called third-country acceptances.

All four groups of banks that we describe earlier in this chapter create bankers acceptances (that is, are accepting banks). They have their own sales forces to sell bankers acceptances rather than using the services of a dealer. The larger regional banks maintain their own sales forces to sell the bankers acceptances they create but will use dealers to distribute those they cannot sell.

Bankers acceptances are sold on a discounted basis just as Treasury bills and commercial paper. The major investors in bankers acceptances are money market mutual funds and municipal entities.

To calculate the rate to be charged the customer for issuing a bankers acceptance, the bank determines the rate for which it can sell its bankers acceptance in the open market. To this rate it adds a commission.

Illustration of the Creation of a Bankers Acceptance

The best way to explain the creation of a bankers acceptance is by an illustration.

Several entities are involved in our transaction:

- Car Imports Corporation of America (Car Imports), a firm in New Jersey that sells automobiles
- Germany Fast Autos Inc. (GFA), a manufacturer of automobiles in Germany
- First Hoboken Bank (Hoboken Bank), a commercial bank in Hoboken, New Jersey
- West Berlin National Bank (Berlin Bank), a bank in Germany
- High-Caliber Money Market Fund, a mutual fund in the United States that invests in money market instruments

Car Imports and GFA are considering a commercial transaction. Car Imports wants to import 15 cars manufactured by GFA. GFA is concerned with the ability of Car Imports to make payment on the 15 cars when they are received.

Acceptance financing is suggested as a means for facilitating the transaction. Car Imports offers $300,000 for the 15 cars. The terms of the sale stipulate payment to be made to GFA 60 days after it ships the 15 cars to Car Imports. GFA determines whether it is willing to accept the $300,000. In considering the offering price, GFA must calculate the present value of the $300,000, because it will not be receiving payment until 60 days after shipment. Suppose that GFA agrees to these terms.

Car Imports arranges with its bank, Hoboken Bank, to issue a letter of credit. The letter of credit indicates that Hoboken Bank will make good on the payment of $300,000 that Car Imports must make to GFA 60 days after shipment. The letter of credit, or time draft, will be sent by Hoboken Bank to GFA's bank, Berlin Bank. Upon receipt of the letter of credit, Berlin Bank will notify GFA, which will then ship the 15 cars. After the cars are shipped, GFA presents the shipping documents to Berlin Bank and receives the present value of $300,000. GFA is now out of the picture.

Berlin Bank presents the time draft and the shipping documents to Hoboken Bank. The latter will then stamp "accepted" on the time draft. By doing so, Hoboken Bank has created a bankers acceptance. This means that Hoboken Bank agrees to pay the holder of the bankers acceptance $300,000 at the maturity date. Car Imports will receive the shipping documents so that it can procure the 15 cars once it signs a note or some other type of financing arrangement with Hoboken Bank.

At this point, the holder of the bankers acceptance is the Berlin Bank. It has two choices. It can continue to hold the bankers acceptance as an investment in its loan portfolio, or it can request that Hoboken Bank make a payment of the present value of $300,000. Let's assume that Berlin Bank requests payment of the present value of $300,000.

Now the holder of the bankers acceptance is Hoboken Bank. It has two choices: retain the bankers acceptance as an investment as part of its loan portfolio, or sell it to an investor. Suppose that Hoboken Bank chooses the latter, and that High-Caliber Money Market Fund is seeking a high-quality investment with the same maturity as that of the bankers acceptance. Hoboken Bank sells the bankers acceptance to the money market fund at the present value of $300,000. Rather than sell the instrument directly to an investor, Hoboken Bank could sell it to a dealer, who would then resell it to an investor such as a money market fund. In either case, at the maturity date, the money market fund presents the bankers acceptance to Hoboken Bank, receiving $300,000, which the bank in turn recovers from Car Imports.

Eligible Bankers Acceptance

An accepting bank that has decided to retain a bankers acceptance in its portfolio may be able to use it as collateral for a loan at the discount window of the Federal Reserve. The reason we say "may" is that, to be used as collateral, bankers acceptances must meet certain eligibility requirements established by the Federal Reserve. One requirement for eligibility is maturity, which with a few exceptions cannot exceed six months. While the other requirements for eligibility are too detailed to review here, the basic principle is simple. The bankers acceptance should be financing a self-liquidating commercial transaction.

Eligibility is also important because the Federal Reserve imposes a reserve requirement on funds raised via bankers acceptances that are ineligible. Bankers acceptances sold by an accepting bank are potential liabilities of the bank, but no reserve requirements are imposed for eligible bankers acceptances. Consequently, most bankers acceptances satisfy the various eligibility criteria. Finally, the Federal Reserve also imposes a limit on the amount of eligible bankers acceptances that may be issued by a bank.[3]

Credit Risk

Investing in bankers acceptances exposes the investor to credit risk. This is the risk that neither the borrower nor the accepting bank will be able to pay the principal due at the maturity date. The market interest rates that acceptances offer investors reflect this risk because BAs have higher yields than risk-free Treasury bills. A yield may also include a premium for relative illiquidity. The BA yield has such a premium because its secondary market is far less developed than that of the Treasury. Hence, the spread between BA rates and Treasury rates represents a combined reward to investors for bearing the higher risk and relative illiquidity of the acceptance. That spread is not constant over time. The change in the spread reveals shifting investor valuation of the risk and illiquidity differences between the assets.

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[3] It may not exceed 150% of a bank's capital and surplus.

Key Points That You Should Understand Before Proceeding

1. A bankers acceptance is a vehicle created to facilitate commercial trade transactions wherein a bank accepts the ultimate responsibility to repay a loan to its holder.
2. Banks creating banker acceptances are money center banks, regional banks, Japanese banks, and Yankee banks.
3. Eligible bankers acceptances held in a bank's portfolio may be used as collateral for a loan at the discount window of the Federal Reserve.
4. A bank may sell its bankers acceptances directly to investors, or may sell all or part to dealers.
5. The investor in a bankers acceptance is exposed to credit risk.

SUMMARY

Commercial banks raise funds in the same equity and debt markets that we describe in earlier chapters of the book. In addition, they can issue special debt obligations: large-denomination CDs, federal funds, and bankers acceptances.

Certificates of deposit are issued by banks and thrifts to raise funds for financing their business activities. Unlike other bank deposits, these are negotiable in the secondary market. CDs can be classified into four types: domestic CDs, Eurodollar CDs, Yankee CDs, and thrift CDs. Unlike Treasury bills, commercial paper, and bankers acceptances, yields on domestic CDs are quoted on an interest-bearing basis. A floating-rate CD is one whose coupon interest rate changes periodically in accordance with a predetermined formula. The rate paid on Eurodollar CDs has become an important rate because it is viewed as the global cost of borrowing. The rate or yield paid on Eurodollar CDs is LIBOR.

The federal funds market is the market where depository institutions borrow (buy) and sell (lend) excess reserves held in the form of deposits in a Federal Reserve bank. The federal funds rate, which is the rate at which all money market interest rates are anchored, is determined in this market. The federal funds rate is higher than the repo rate because borrowing done in the federal funds market is unsecured borrowing. The fed funds rate is often a target of the Fed's monetary policy, so it can exhibit a considerable amount of volatility or change in level over time.

A bankers acceptance is a vehicle created to facilitate commercial trade transactions, particularly international transactions. The name, bankers acceptance, arises because a bank accepts the responsibility to repay a loan to the holder of the vehicle created in a commercial transaction in case the debtor fails to perform. Bankers acceptances are sold on a discounted basis, as are Treasury bills and commercial paper.

KEY TERMS

- Acceptance financing
- Accepting bank
- Bankers acceptance
- Certificate of deposit (CD)
- Effective fed funds rate
- Eurodollar CD
- Japanese bank
- London interbank offered rate (LIBOR)
- Money center bank
- Negotiable

- Nonprime CD
- Prime CD
- Regional bank
- Term CD
- Thrift CD
- Yankee bank
- Yankee CD

QUESTIONS

1. Explain the difference between a domestic U.S. bank and a Yankee bank.
2. Explain what a negotiable certificate of deposit is.
3. What are the four types of negotiable CDs?
4. **a.** What is the chief reason that the yield on a six-month CD exceeds that on a six-month Treasury bill?
   b. Explain why a Eurodollar CD should offer a higher yield than a domestic CD issued by the same bank for the same time to maturity.
5. **a.** What is the London interbank offered rate?
   b. Why has this rate become so important in financial markets?
6. Explain how federal funds are related to the reserve requirements that the Federal Reserve places on commercial banks.
7. How does a repurchase agreement that a bank might enter into with a securities dealer regarding a U.S. Treasury bill substitute for the borrowing federal funds from another bank?
8. Why are fed funds called overnight money?
9. Explain whether or not the rate on an overnight repurchase agreement can be higher than the rate on overnight federal funds.
10. What is the chief reason that the fed funds rate is an unusually volatile short-term interest rate?
11. What are the four transactions whose financing can lead to the creation of bankers acceptances?
12. Why is a bank that creates a BA called an accepting bank?
13. Why is the eligibility of a bankers acceptance important?
14. How does a bank determine the rate it will charge its customer for issuing a bankers acceptance?