Municipal Securities Markets

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Municipal Securities Markets

LEARNING OBJECTIVES

After reading this chapter, you will understand

- who buys municipal securities and why the securities are attractive investments to these buyers
- the types of municipal securities and why they are issued
- the risks unique to investment in municipal securities
- the primary and secondary markets for municipal securities
- the yield relationship between municipal securities and taxable bonds
- the yield relationships among municipal securities within the municipal market
- the degree of regulation of the municipal securities market

In this chapter, we discuss municipal securities and the market in which they trade. Municipal securities are issued by state and local governments and by entities that they establish. All states issue municipal securities. Local governments include cities and counties. Political subdivisions of municipalities that issue securities include school districts and special districts for fire prevention, water, sewer, and other purposes. Public agencies or instrumentalities include authorities and commissions.

From an investor's perspective, the attractiveness of municipal securities is due to their tax treatment at the federal income tax level. Most municipal securities are tax exempt. This means that interest on municipal bonds is exempt from federal income taxation. The exemption applies to interest income, not capital gains. The exemption may or may not extend to the state and local levels. Each state has its own rule as to how interest on municipal securities is taxed.[1]

[1] The tax treatment at the state level will be one of the following: (1) exemption of interest from all municipal securities, (2) taxation of interest from all municipal securities, (3) exemption of interest from municipal securities where the issuer is in the state but taxation of interest where the issuer is out of the state.

While most municipal bonds outstanding are tax exempt, there are issues that are taxable at the federal level.

Municipal securities are issued for various purposes. Short-term notes typically are sold in anticipation of the receipt of funds from taxes or proceeds from the sale of a bond issue, for example. The proceeds from the sale of short-term notes permit the issuing municipality to cover seasonal and temporary imbalances between outlays for expenditures and tax inflows. Municipalities issue long-term bonds as the principal means for financing both (1) long-term capital projects such as the construction of schools, bridges, roads, and airports; and (2) long-term budget deficits that arise from current operations.

As the single most important advantage of municipal securities to investors is the exemption of interest income from federal taxation, the investor groups that have purchased these securities are those that benefit the most from this exemption. The three categories of investors dominating the municipal securities market are households (retail investors), commercial banks, and property and casualty insurance companies. Individual investors may purchase municipal securities directly or through investment companies.

TYPES AND FEATURES OF MUNICIPAL SECURITIES[2]

There are basically two types of municipal security structures: **tax-backed debt** and **revenue bonds**. There are also securities that share characteristics of tax-backed debt and revenue bonds.

Tax-Backed Debt

Tax-backed debt obligations are instruments issued by states, counties, special districts, cities, towns, and school districts that are secured by some form of tax revenue. Tax-backed debt includes general obligation debt, appropriation-backed obligations, and debt obligations supported by public credit enhancement programs.

General Obligation Debt

The broadest type of tax-backed debt is **general obligation debt**. There are two types of general obligation pledges: unlimited and limited. An unlimited tax general obligation debt is the stronger form of general obligation pledge because it is secured by the issuer's unlimited taxing power. The tax revenue sources include corporate and individual income taxes, sales taxes, and property taxes. Unlimited tax general obligation debt is said to be secured by the full faith and credit of the issuer. A limited tax general obligation debt is a limited tax pledge because for such debt there is a statutory limit on tax rates that the issuer may levy to service the debt.

Certain general obligation bonds are secured not only by the issuer's general taxing powers to create revenues accumulated in a general fund but also by certain identified fees, grants, and special charges, which provide additional revenues from outside the general fund. Such bonds are known as double-barreled in security because of the dual nature of the revenue sources. For example, the debt obligations issued by special-purpose service systems may be secured by a pledge of property taxes, a pledge of special fees/operating revenue from the service provided, or a pledge of both property taxes and special fees/operating revenues. In the last case, they are double-barreled.

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[2] For a further discussion of these securities, see Chapter 5 in Frank J. Fabozzi, *Fixed Income Securities* (New Hope, PA: Frank J. Fabozzi Associates, 1998).

Appropriation-Backed Obligations

Agencies or authorities of several states have issued bonds that carry a potential state liability for making up shortfalls in the issuing entity's obligation. The appropriation of funds from the state's general tax revenue must be approved by the state legislature. However, the state's pledge is not binding. Debt obligations with this nonbinding pledge of tax revenue are called moral obligation bonds. Because a moral obligation bond requires legislative approval to appropriate the funds, it is classified as an appropriation-backed obligation. The purpose of the moral obligation pledge is to enhance the creditworthiness of the issuing entity. However, the investor must rely on the best efforts of the state to approve the appropriation. Another type of appropriation-backed obligation is lease-backed debt.

Debt Obligations Supported by Public Credit Enhancement Programs

While a moral obligation is a form of credit enhancement provided by a state, it is not a legally enforceable or legally binding obligation of the state. There are entities that have issued debt that carries some form of public credit enhancement that is legally enforceable. This occurs when there is a guarantee by the state or a federal agency or when there is an obligation to automatically withhold and deploy state aid to pay any defaulted debt service by the issuing entity. Typically, the latter form of public credit enhancement is used for debt obligations of a state's school systems.

Some examples of state credit enhancement programs include Virginia's bond guarantee program that authorizes the governor to withhold state aid payments to a municipality and divert those funds to pay principal and interest to a municipality's general obligation holders in the event of a default. South Carolina's constitution requires mandatory withholding of state aid by the state treasurer if a school district is not capable of meeting its general obligation debt. Texas created the Permanent School Fund to guarantee the timely payment of principal and interest of the debt obligations of qualified school districts. The fund's income is obtained from land and mineral rights owned by the state of Texas.

Revenue Bonds

The second basic type of security structure is found in a revenue bond. Such bonds are issued for either project or enterprise financings where the bond issuers pledge to the bondholders the revenues generated by the operating projects financed. A feasibility study is performed before the endeavor is undertaken to determine whether or not it will be self-supporting.

Following are examples of revenue bonds: airport revenue bonds, college and university revenue bonds, hospital revenue bonds, single-family mortgage revenue bonds, multifamily revenue bonds, public power revenue bonds, resource recovery revenue bonds, seaport revenue bonds, sports complex and convention center revenue bonds, student loan revenue bonds, toll road and gas tax revenue bonds, and water revenue bonds.

Hybrid and Special Bond Structures

Some municipal securities have special security structures that share characteristics of tax-backed debt and revenue bonds. These include insured bonds, prerefunded bonds, and structured/asset-based bonds.

Insured Bonds

Insured bonds, in addition to being secured by the issuer's revenue, are also backed by insurance policies written by commercial insurance companies. Insurance on a municipal bond is an agreement by an insurance company to pay the bondholder any bond principal and/or coupon interest that is due on a stated maturity date but that has not been paid by the bond issuer. Once issued, this municipal bond insurance usually extends for the term of the bond issue, and it cannot be canceled by the insurance company.

Prerefunded Bonds

Although originally issued as either revenue or general obligation bonds, municipals are sometimes prerefunded and called **prerefunded municipal bonds**. (They are also called **refunded bonds**.) A prerefunding usually occurs when the original bonds are escrowed or collateralized by direct obligations guaranteed by the U.S. government.[3] By this, it is meant that a portfolio of securities guaranteed by the U.S. government is placed in a trust. The portfolio of securities is assembled such that the cash flows from the securities match the obligations that the issuer must pay. For example, suppose that a municipality has a 7% $100 million issue with 12 years remaining to maturity. The municipality's obligation is to make payments of $3.5 million every six months for the next 12 years and $100 million 12 years from now. If the issuer wants to prerefund this issue, a portfolio of U.S. government obligations can be purchased that has a cash flow of $3.5 million every six months for the next 12 years and $100 million 12 years from now.

Once this portfolio of securities whose cash flows match those of the municipality's obligation is in place, the prerefunded bonds are no longer secured as either general obligation or revenue bonds. The bonds are now supported by cash flows from the portfolio of securities held in an escrow fund. Such bonds, if escrowed with securities guaranteed by the U.S. government, have little, if any, credit risk. They are the safest municipal bonds available.

The escrow fund for a prerefunded municipal bond can be structured so that the bonds to be refunded are to be called at the first possible call date or a subsequent call date established in the original bond indenture. Although prerefunded bonds are usually retired at their first or subsequent call date, some are structured to match the debt obligation to the maturity date. Such bonds are known as *escrowed-to-maturity bonds*.

Asset-Backed Bonds

In recent years, states and local governments began issuing bonds where the debt service is to be paid from so-called "dedicated" revenues such as sales taxes, tobacco settlement payments, fees, and penalty payments. These structures, called **asset-backed bonds**, mimic asset-backed securities. Asset-backed bonds are also referred to as **dedicated revenue bonds** and **structured bonds**.

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[3] Because the interest rate that a municipality must pay on borrowed funds is less than the interest rate paid by the U.S. government, in the absence of any restrictions in the tax code, a municipal issuer can realize a tax arbitrage. This can be done by issuing a bond and immediately investing the proceeds in a U.S. government security. Tax rules may prevent such arbitrage in some cases. Should a municipal issuer violate the tax arbitrage rules, the issue will be ruled to be taxable. If subsequent to the issuance of a bond, however, interest rates decline so that the issuer will find it advantageous to call the bond, the establishment of the escrow fund will not violate the tax arbitrage rules.

Municipal Notes

Municipal securities issued for periods up to three years are considered to be short term in nature. These include **tax anticipation notes (TANs)**, **revenue anticipation notes (RANs)**, **grant anticipation notes (GANs)**, and **bond anticipation notes (BANs)**.

TANs, RANs, GANs, and BANs are temporary borrowings by states, local governments, and special jurisdictions. Usually, notes are issued for a period of 12 months, although it is not uncommon for notes to be issued for periods as short as three months and for as long as three years. TANs and RANs (also known as TRANs) are issued in anticipation of the collection of taxes or other expected revenues. The purpose of these borrowings is to even out irregular flows into the treasuries of the issuing entity. BANs are issued in anticipation of the sale of long-term bonds.

Redemption Features

Municipal bonds are issued with one of two debt retirement structures or a combination of both. Either a bond has a **serial maturity structure** or a **term maturity structure**. A serial maturity structure requires a portion of the debt obligation to be retired each year. A term maturity structure provides for the debt obligation to be repaid at the end of the bond's planned life. Usually, term bonds have maturities ranging from 20 to 40 years. Such bonds often have sinking fund provisions that call for partial and systematic retirement of the debt on a set schedule that begins five or ten years before the time of maturity. Another provision that permits the early redemption of a term bond is the call privilege, which allows the issuer, under certain and well-specified circumstances, to pay off the debt prior to the scheduled maturity. Sinking fund and call provisions are noted features of corporate debt.

Key Points That You Should Understand Before Proceeding

1. There are two types of municipal securities: tax-backed debt and revenue bonds.
2. A general obligation bond is secured by the issuer's unlimited taxing power.
3. A revenue bond is issued for either project or enterprise financings where the bond issuer pledges the revenues generated by the project that is financed to the bondholders.
4. Municipal notes are issued for periods up to three years and represent temporary borrowings by states, local governments, and special jurisdictions.
5. The debt retirement structure for a municipal bond can be either a serial maturity structure or a term maturity structure.

MUNICIPAL BOND RATINGS

Although municipal bonds have long been considered second in safety only to U.S. Treasury securities, today there are new concerns about the credit risks of many municipal bonds.[4]

The first concern came out of the New York City billion-dollar financial crisis in 1975. On February 25, 1975, the state of New York's Urban Development Corporation defaulted on a $100 million note issue that was the obligation of New York City. Many market participants

[4] For a history of defaults of municipal bonds, see Chapter 2 in Sylvan G. Feldstein and Frank J. Fabozzi, *The Dow Jones-Irwin Guide to Municipal Bonds* (Homewood, IL: Dow Jones-Irwin, 1987).

had been convinced that the state of New York would not allow the issue to default. Although New York City was able later to obtain a $140 million revolving credit from banks to cure the default, lenders became concerned that the city would face difficulties in repaying its accumulated debt, which stood at $14 billion on March 31, 1975.[5] This financial crisis sent a loud and clear warning to market participants: Despite supposedly ironclad protection for the bondholder, when issuers such as large cities have severe financial difficulties, the financial stakes of public employee unions, vendors, and community groups may be dominant forces in balancing budgets. This reality was reinforced by the federal bankruptcy law taking effect in October 1979, which makes it easier for the issuer of a municipal security to go into bankruptcy.

The second reason for concern about the credit risk of municipal securities is the proliferation in this market of innovative financing techniques to secure new bond issues. In addition to the established general obligation bonds and revenue bonds, there are now more innovative, and legally untested, security mechanisms that do not require voters' approval of new debt. What distinguishes these newer bonds from the more traditional general obligation and revenue bonds is that there is no history of court decisions or other case law that firmly establishes the rights of the bondholders and the obligations of the issuers. It is not possible to determine in advance the probable legal outcome if the newer financing mechanisms were to be challenged in court. The importance of this uncertainty is illustrated most dramatically by the bonds of the Washington Public Power Supply System (WPPSS), where bondholder rights to certain revenues were not upheld by the highest court in the state of Washington.

More recently, municipal bond investors have been increasingly concerned with those who manage the investment funds of municipalities. This concern was the result of the collapse of the Orange County (California) Investment Pool, which lost $1.7 billion as a result of a poorly conceived investment strategy by Robert L. Citron, the county treasurer. Citron followed a strategy that resulted in a leveraged position in securities that benefited if interest rates declined. Basically, he used the repurchase agreement. Instead of using the repurchase agreement as a short-term investment vehicle, he used it to create leverage via a reverse repurchase agreement. The loss resulting from this strategy, as well as investments in structured notes, resulted in the bankruptcy of Orange County.[6]

Many institutional investors in the municipal bond market rely on their own in-house municipal credit analysts for determining the creditworthiness of a municipal issue; other investors rely on the three nationally recognized rating companies. The assigned rating system is the same as that used for corporate bonds.

To evaluate general obligation bonds, the commercial rating companies assess information in four basic categories. The first category includes information on the issuer's debt structure and overall debt burden. The second category relates to the issuer's ability and political discipline to maintain sound budgetary policy. The focus of attention here usually is on the issuer's general operating funds and whether it has maintained at least balanced budgets over three to five years. The third category involves determining the specific local

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[5] Securities and Exchange Commission Staff Report on *Transactions in Securities of the City of New York* (Washington, DC: U.S. Government Printing Office, 1977), p. 2. The reasons for the New York City financial crisis are documented in Donna E. Shalala and Carol Bellamy, "A State Saves a City: The New York Case," *Duke Law Journal* (January 1976), pp. 1119–1126.

[6] For an excellent account of the Orange County bankruptcy, see Philipe Jorion, *Big Bets Gone Bad* (New York: Academic Press, 1995).

taxes and intergovernmental revenues available to the issuer, as well as obtaining historical information both on tax collection rates, which are important when looking at property tax levies, and on the dependence of local budgets on specific revenue sources. The fourth and last category of information necessary to the credit analysis is an assessment of the issuer's overall socioeconomic environment. The determinations that have to be made here include trends of local employment distribution and composition, population growth, real estate property valuation, and personal income, among other economic factors.

While there are numerous security structures for revenue bonds, the underlying principle in rating is whether or not the project being financed will generate sufficient cash flow to satisfy the obligations due bondholders.

Key Points That You Should Understand Before Proceeding

1. The investor in a municipal security is exposed to credit risk.
2. Commercial rating companies evaluate the credit risk associated with municipal securities and express the results of their analysis in the form of rating categories.
3. The factors used to determine a rating for a general obligation bond are different from those used for a revenue bond.

TAX RISKS ASSOCIATED WITH INVESTING IN MUNICIPAL SECURITIES

There are two types of tax risk to which tax-exempt municipal securities buyers are exposed. The first is the risk that the federal income tax rate will be reduced. The higher the marginal tax rate, the more valuable the tax-exemption feature. As the marginal tax rate declines, the price of a tax-exempt municipal security will decline. Proposals to reduce the marginal tax rate result in less demand for municipal securities and, as a result, a decline in their price. This occurred most recently in 1995 when there were proposals of a flat tax in which the tax rate would be less than the prevailing rate.

The second type of tax risk is that a municipal bond issued as a tax-exempt issue may be eventually declared by the Internal Revenue Service (IRS) to be taxable. This could happen because many municipal revenue bonds have elaborate security structures that could be subject to future adverse Congressional action and IRS interpretation. A loss of the tax-exemption feature will cause the municipal bond to decline in value in order to provide a yield comparable to similar taxable bonds. An example of this risk is the following situation: In June 1980, the Battery Park City Authority sold $97.315 million in notes, which at the time of issuance seemed to be exempt from federal income taxation. In November 1980, however, the IRS held that interest on these notes was not exempt. The legal question was not settled until September 1981, when the authority and the IRS signed a formal agreement resolving the matter so as to make the interest on the notes tax-exempt.

Key Points That You Should Understand Before Proceeding

1. A tax risk associated with investing in municipal bonds is that the highest marginal tax rate will be reduced, resulting in a decline in the value of municipal bonds.
2. Another tax risk associated with investing in municipal bonds is that a tax-exempt issue may be eventually declared by the IRS to be taxable.

THE PRIMARY MARKET

A substantial number of municipal obligations are brought to market each week. A state or local government can market its new issue by offering bonds publicly to the investing community or by placing them privately with a small group of investors. When a public offering is selected, the issue usually is underwritten by investment bankers and/or municipal bond departments of commercial banks. Public offerings may be marketed by either competitive bidding or direct negotiations with underwriters. In a competitive process, the bidder submitting the highest bid price for the security gets the right to market the debt to investors.

Most states mandate that general obligation issues be marketed through competitive bidding, but generally this is not necessary for revenue bonds. Usually, state and local governments require a competitive sale to be announced in a recognized financial publication, such as *The Bond Buyer*, which is a trade publication for the municipal bond industry. *The Bond Buyer* also provides information on upcoming competitive sales and most negotiated sales, as well as the results of previous weeks. However the debt is marketed, the municipal unit prepares an *official statement* describing its financial situation and the terms of the issue.[7] These terms include the call and sinking fund provisions previously mentioned.

THE SECONDARY MARKET

Municipal bonds are traded in the over-the-counter market supported by municipal bond dealers across the country. Markets for the debts of smaller issuers (referred to as *local credits*) are maintained by regional brokerage firms, local banks, and by some of the larger Wall Street firms. Markets for the bonds of larger issuers (referred to as *general names*) are supported by the larger brokerage firms and banks, many of whom have investment banking relationships with these issuers. There are brokers who serve as intermediaries in the sale of large blocks of municipal bonds among dealers and large institutional investors. Beginning in 2000, bonds in the secondary market as well as some new issue competitive and negotiated issues began to be auctioned and sold over the Internet by large and small broker-dealers to institutional and individual investors.

In the municipal bond market, an odd lot of bonds is $25,000 or less in par value for retail investors. For institutions, anything below $100,000 in par value is considered an odd lot. Dealer spreads depend on several factors. For the retail investor, the spread can range from as low as one-quarter of one point ($12.50 per $5,000 par value) on large blocks of actively traded bonds to four points ($200 per $5,000 of par value) for odd-lot sales of an inactive issue. For institutional investors, the dealer spread rarely exceeds one-half of one point ($25 per $5,000 of par value).

The convention for both corporate and Treasury bonds is to quote prices as a percentage of par value with 100 equal to par. Municipal bonds, however, generally are traded and quoted in terms of yield (yield to maturity or yield to call). The price of the bond in this case is called a *basis price*. The exception is certain long-maturity revenue bonds. A bond traded and quoted in dollar prices (actually, as a percentage of par value) is called a *dollar bond*.

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[7] Nationally Recognized Municipal Securities Information Repositories (NRMSIRS) serve as the central collectors and disseminators of information about municipal securities.

Actual price and trade information for specific municipal bonds is available on a daily basis at no charge via the Internet at www.investinginbonds.com. It is the home page of the Bond Market Association. The trade information provided is from the Municipal Securities Rulemaking Board and Standard & Poor's J.J. Kenny. The original source of the trades reported is transactions between dealer to dealer and dealer to institutional customer and retail (individual investor).

THE TAXABLE MUNICIPAL BOND MARKET

Taxable municipal bonds are bonds whose interest is taxed at the federal income tax level. Because there is no tax advantage, an issuer must offer a higher yield than for another tax-exempt municipal bond. The yield must be higher than the yield on U.S. government bonds because an investor faces credit risk by investing in a taxable municipal bond. The investors in taxable municipal bonds are investors who view them as alternatives to corporate bonds.

Why would a municipality want to issue a taxable municipal bond and thereby have to pay a higher yield than if it issued a tax-exempt municipal bond? There are three reasons for this. First, prior to 1986, there were many more activities that municipalities could finance by issuing tax-exempt municipal bonds. The U.S. Congress felt that some of these activities should not be financed with tax-exempt municipal bonds because such activities do not benefit the public at large. As a result, Congress passed the Tax Reform Act of 1986, which imposed restrictions on what types of projects could be financed using tax-exempt municipal bonds. For example, within a particular project there is a maximum amount imposed on the issuance of tax-exempt municipal bonds for private activity bonds—the maximum amount is the greater of $150 million or $50 per state resident per year. As a result, municipalities had to finance these restricted activities in the taxable bond market.

The second reason is that the U.S. income tax code imposes restrictions on arbitrage opportunities that a municipality can realize from its financing activities. The third reason is that municipalities do not view their potential investor base as solely U.S. investors. Some issuers, for example, have been active issuers of bonds outside of the United States. When bonds are issued outside of the United States, the investor does not benefit from the tax-exempt feature. These last two reasons have to do with the flexibility afforded a municipality by using the taxable bond market rather than the tax-exempt bond market.

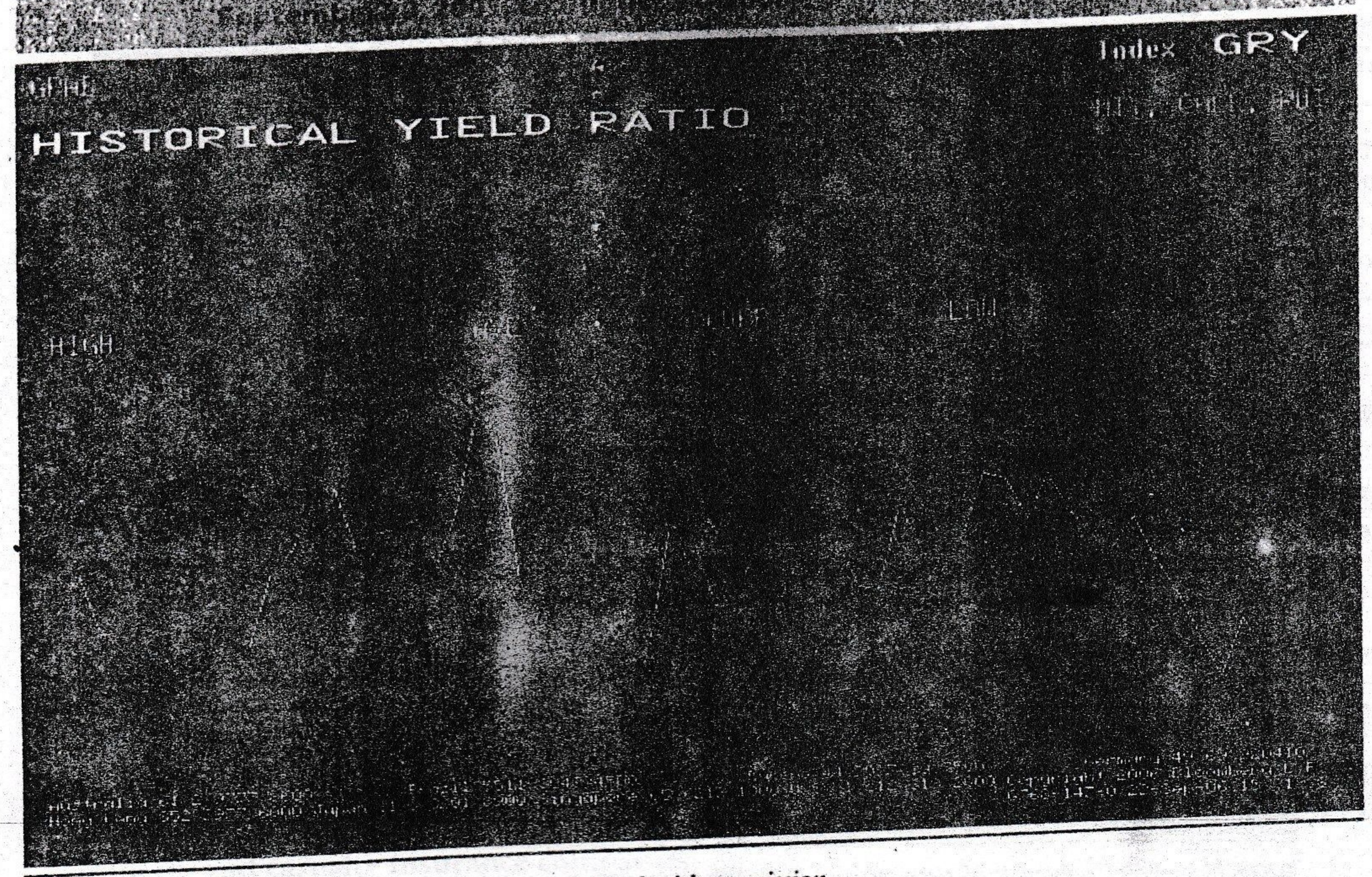
The most common types of activities for taxable municipal bonds used for financing are (1) local sports facilities, (2) investor-led housing projects, (3) advanced refunding of issues that are not permitted to be refunded because the tax law prohibits such activity, and (4) underfunded pension plan obligations of the municipality.

YIELDS ON MUNICIPAL BONDS

Because of the tax-exempt feature of municipal bonds, the yield on municipal bonds is usually less than that on Treasuries with the same maturity. The difference in yield between tax-exempt securities and Treasury securities is typically measured not in basis points but in percentage terms. More specifically, it is measured as the percentage of the yield on a municipal security relative to a comparable Treasury security and is called the **yield ratio.**

The yield ratio has changed over time. The higher the tax rate, the more attractive the tax-exempt feature and the lower the yield ratio. The yield ratio varies over time. This can be seen in Figure 1. The figure shows the yield ratio computed from the 20-year AAA general obligation bond and the 20-year Treasury bond from September 28, 2001, to August 31, 2006.

Figure 1 Historical Municipal Bond Yield Ratios: 30-Year Issues



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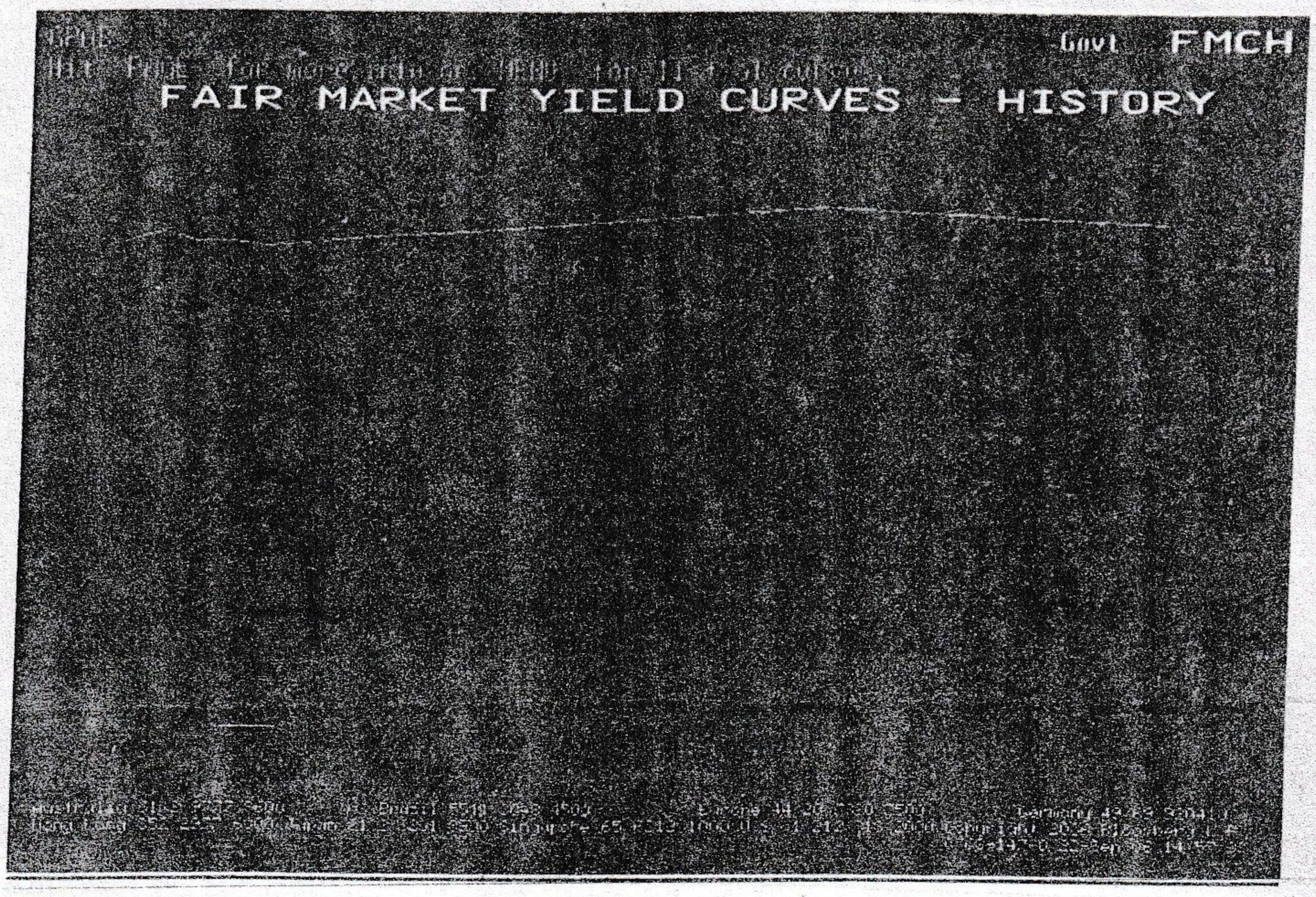
In the municipal bond market, several benchmark curves exist. In general, a benchmark yield curve is constructed for a AAA quality-rated state general obligation. In the Treasury and corporate bond markets, it is not unusual to find at different times shapes for the yield curve. In general, the municipal yield curve is positively sloped, as can be seen in Figure 2. There was a brief period where the municipal yield curve became inverted. However, during the period when the Treasury yield curve was inverted, the municipal yield curve maintained its upward-sloping shape. Prior to 1986, the municipal yield curve was consistently steeper than the Treasury yield curve as measured by the spread between the 30-year and one-year issues. Between 1986 and 1990, the steepness was comparable. In 1991, the municipal yield curve became steeper than the Treasury yield curve.

REGULATION OF THE MUNICIPAL SECURITIES MARKET[8]

Congress has specifically exempted municipal securities from both the registration requirements of the Securities Act of 1933 and the periodic reporting requirements of the Securities Exchange Act of 1934. When there was a significant expansion of the federal securities in

[8]Parts of this section are drawn from Thomas F. Mitchell, "Disclosure and the Municipal Bond Industry," Chapter 40, and Nancy H. Wojtas, "The SEC and Investor Safeguards," Chapter 42 in Frank J. Fabozzi, Sylvan G. Feldstein, Irving M. Pollack, and Frank Zarb (eds.), *The Municipal Bond Handbook: Volume I* (Homewood, IL: Dow Jones-Irwin, 1983). For a more recent discussion, see Paul S. Maco and Cristy C. Edwards, "The Role of the SEC," Chapter 23 in Sylvan Feldstein and Frank J. Fabozzi (eds.), *Handbook of Municipal Bonds* (Hoboken, NJ: John Wiley & Sons, 2008).

Figure 2 Municipal Yield Curves



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2002 with the passage of the Sarbanes-Oxley Act, Congress once again exempted issuers of municipal securities from the application from some of the important changes. However, antifraud provisions apply nevertheless to offerings of, or dealings in, municipal securities.

The reasons for the exemption afforded municipal securities appear to relate to (1) a desire for harmonious and cooperative relations among the various levels of government in the United States, (2) the absence of recurrent abuses in transactions involving municipal securities, (3) the greater level of sophistication of investors in this segment of the securities markets (the market was long dominated by institutional investors), and (4) the fact that there had been few defaults by municipal issuers. Consequently, between the enactment of federal securities acts in the early 1930s and early 1970s, the municipal securities market was relatively free from federal regulation.

In the early 1970s, however, circumstances changed. As incomes rose, individual investors began to participate in the municipal securities market to a much greater extent, and public concern over selling practices was expressed with greater frequency. Moreover, the financial problems of some municipal issuers, notably New York City, made market participants aware that municipal issuers have the potential to experience severe financial difficulties approaching bankruptcy levels.

Congress passed the Securities Act Amendment of 1975 to broaden federal regulation in the market for municipal debt. This legislation brought brokers and dealers in the municipal securities market, including banks that underwrite and trade municipal securities, under the regulatory umbrella of the Securities Exchange Act of 1934. The legislation mandated also

that the SEC establish a 15-member Municipal Securities Rulemaking Board (MSRB) as an independent, self-regulatory agency whose primary responsibility is to develop rules governing the activities of banks, brokers, and dealers in municipal securities. Rules adopted by the MSRB must be approved by the SEC. The MSRB has no enforcement or inspection authority. That authority is vested with the SEC, the National Association of Securities Dealers, and certain regulatory banking agencies such as the Federal Reserve Bank.

The Securities Act Amendment of 1975 does not require municipal issuers to comply with the registration requirement of the 1933 act or the periodic reporting requirement of the 1934 act, despite several legislative proposals to mandate such financial disclosure. However, the SEC has been active in monitoring disclosure information for municipal securities. Even in the absence of federal legislation dealing with the regulation of financial disclosure, however, underwriters began insisting upon greater disclosure as it became apparent that the SEC was exercising stricter application of the antifraud provisions. Moreover, underwriters recognized the need for improved disclosure to sell municipal securities to an investing public that had become much more concerned about the credit risk of municipal issuers.

On June 28, 1989, the SEC formally approved the first bond disclosure rule, effective January 1, 1990. While the disclosure rule has several exemptions, in general it applies to new issue municipal securities offerings of $1 million or more.

SUMMARY

Municipal securities are issued by state and local governments and their authorities, with the interest on most issues being exempt from federal income taxes. The primary investors in these securities are households (which includes mutual funds), commercial banks, and property and casualty insurance companies.

There are both tax-exempt and taxable municipal securities, where "tax-exempt" means that interest on a municipal security is exempt from federal income taxation; most municipal securities that have been issued are tax-exempt.

There are basically two types of municipal security structures: tax-backed debt and revenue bonds. Tax-backed debt obligations are instruments issued by states, counties, special districts, cities, towns, and school districts that are secured by some form of tax revenue. Tax-backed debt includes general obligation debt (the broadest type of tax-backed debt), appropriation-backed obligations, and debt obligations supported by public credit enhancement programs. A general obligation bond is said to be double-barreled when it is secured not only by the issuer's general taxing powers to create revenues accumulated in a general fund but also by certain identified fees, grants, and special charges, which provide additional revenues from outside the general fund. Revenue bonds are issued for enterprise financings that are secured by the revenues generated by the completed projects themselves, or for general public-purpose financings in which the issuers pledge to the bondholders the tax and revenue resources that were previously part of the general fund.

Insured bonds, in addition to being secured by the issuer's revenue, are backed by insurance policies written by commercial insurance companies. Prerefunded bonds are no longer secured as either general obligation or revenue bonds but are supported by a portfolio of securities held in an escrow fund. If escrowed with securities guaranteed by the U.S. government, refunded bonds are the safest municipal bonds available. A prerefunded municipal bond is one in which the escrow fund is structured so that the bonds are to be called at the

first possible call date or a subsequent call date established in the original bond indenture. There are municipal securities structured as asset-backed securities that are backed by "dedicated" revenues such as sales taxes, tobacco settlement payments, fees, and penalty payments.

Municipal notes are issued for shorter periods (one to three years) than municipal bonds. Municipal bonds may be retired with a serial maturity structure, a term maturity structure, or a combination of both. Investing in municipal securities exposes investors to credit risk and tax risk.

KEY TERMS

- Appropriation-backed obligation
- Asset-backed bond
- Bond anticipation note (BAN)
- Dedicated revenue bond
- General obligation debt
- Grant anticipation note (GAN)
- Insured bonds
- Moral obligation bond
- Prerefunded bonds (refunded bonds)
- Revenue bonds
- Revenue anticipation note (RAN)
- Serial maturity structure
- Structured bond
- Tax anticipation note (TAN)
- Tax-backed debt
- Taxable municipal bond
- Term maturity structure
- Yield ratio

QUESTIONS

1. Explain why you agree or disagree with the following statement: "All municipal bonds are exempt from federal income taxes."
2. a. Who are the three major investors in municipal securities?
   b. What aspect of their situation and what feature of these bonds attract these investors to this market?
3. If it is expected that the U.S. Congress will change the tax law so as to increase marginal tax rates, what do you think will happen to the price of municipal bonds?
4. What is the major difference between a tax-backed debt and a revenue bond?
5. What is the difference between a limited and unlimited general obligation bond?
6. a. Why are more municipal bonds insured today than in 1970?
   b. In your view, would the typical AAA rated municipal bond be insured?
7. "A moral obligation bond is a form of a limited general obligation bond." Explain why you agree or disagree with this statement.
8. a. What is a prerefunded bond?
   b. Identify two reasons why an issuing municipality would want to prerefund an outstanding bond.
9. Why does a properly structured prerefunded municipal bond have no credit risk?
10. In recent years, municipalities have begun to issue asset-backed securities. What are the revenues of these securities backed by?
11. For years, observers and analysts of the debt market believed that municipal securities were free of any risk of default. Why do most people now believe that municipal debt can carry a substantial amount of credit or default risk?
12. Because many people know that interest payments on municipal debt generally are exempt from taxation by the federal government, they would undoubtedly be surprised by the term tax risk of investing in municipal bonds. Can you explain this term and state why an astute investor should always be aware of this risk when buying municipal bonds?

13. How does the shape of the Treasury yield curve compare to that of the municipal yield curve?
14. Why isn't the Treasury yield curve used as a benchmark in measuring yield spreads between different sectors of the municipal bond market?
15. Are municipal securities exempt from regulation by the SEC?
16. The four largest tobacco companies in the United States reached a settlement with 46 state attorneys general to pay a total of $206 billion over the following 25 years.
    a. States and municipalities, New York City being the first, sold bonds backed by the future payments of the tobacco companies. What are these bonds called?
    b. What is the credit risk associated with these bonds?

Markets for Common Stock: The Basic Characteristics

From Chapter 17 of *Foundations of Financial Markets and Institutions*, 4/e. Frank J. Fabozzi. Franco Modigliani. Frank J. Jones.
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Markets for Common Stock
The Basic Characteristics[1]

LEARNING OBJECTIVES

After reading this chapter, you will understand

- trading mechanisms such as the types of orders, short selling, and margin transactions
- the types of transaction costs encountered when trading stocks
- trading arrangements to accommodate institutional traders such as block trades and program trades
- what the upstairs market is and its role in institutional trading
- price limits and collars imposed by exchanges
- the role played by stock market indicators and how those indicators are constructed
- various stock market indicators of interest to market participants
- evidence on the pricing efficiency of the stock market
- the implications of pricing efficiency for a common stock strategy

This chapter is devoted to common stock and the secondary markets where they trade. It is on the common stock market that investors express their opinions about the economic prospect of a company through the trades they make. The aggregate of these trades gives the market consensus opinion about the price of the stock. In turn, the company's cost of common stock is determined. Three interacting factors contributed to significant changes experienced by this market over the past 50 years: (1) the institutionalization of the stock market as a result

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[1] This chapter draws from Frank J. Fabozzi, Frank J. Jones, Robert R. Johnson, and Bruce M. Collins, "Common Stock Markets, Trading Arrangements, and Trading Costs," Chapter 6 in Frank J. Fabozzi and Harry M. Markowitz (eds.), *The Theory and Practice of Investment Management* (Hoboken, NJ: John Wiley & Sons, 2002) and Frank J. Jones and Frank J. Fabozzi, "Common Stock Markets," Chapter 11 in Frank J. Fabozzi (ed.), *The Handbook of Finance: Volume I* (Hoboken, NJ: John Wiley & Sons, 2008).

of a shift away from traditional small investors to large institutional investors, (2) changes in government regulation of the market, and (3) innovation due largely to advances in computer technology. The institutionalization of this market imposes important implications for the design of trading systems, because the demands made by institutional investors differ from those made by traditional small investors.

Our focus in this chapter is on the basics of common stock trading, the costs associated with common stock trading, stock market indicators (indexes), and the efficiency of the stock market. Trading costs go well beyond the most obvious one of commissions and have important implications for the design of secondary markets. The most controversial aspect of the common stock market described in this chapter is the notion of market efficiency because of its impact on the design of common stock investment strategies. As we will see, there are two market structure designs: order driven and quote driven. The major controversy is which one is the best market structure for investors.

COMMON STOCK CHARACTERISTICS

Equity securities represent an ownership interest in a corporation. Holders of equity securities are entitled to the earnings of the corporation when those earnings are distributed in the form of dividends. They are also entitled to a pro rata share of the remaining equity in case of liquidation. The two types of equity securities are *common stock* and **preferred stock**. The key distinction between these two forms of equity securities lies in the degree to which they may participate in any distribution of earnings and the priority given to each in the distribution of earnings. Typically, preferred stockholders are entitled to a fixed dividend that they receive before common stockholders may receive dividends. We refer, therefore, to preferred stock as a senior corporate security.

For common stock, the total value is equal to the price per share multiplied by the number of common stock shares outstanding. The total value of a corporation's common stock is referred to as its **market capitalization** or simple market cap. For common stock investors, the return realized by holding this investment comes from two sources:

- dividend payments
- change in the price of the common stock

Dividends are distributions made by a corporation to its owners that represent a return on their investment. Dividends are typically in the form of cash. In addition to cash dividends, a corporation may provide shareholders with dividends in the form of additional shares of stock (referred to as stock dividends).[2] Dividends paid to common stockholders are not legal obligations of a corporation and some corporations do not pay cash dividends. But for those companies that pay dividends, changes in dividends are noticed by investors—increases in dividends are viewed favorably and are associated with increases in

[2] Historically, there have been instances where a corporation pays a dividend in the form of some type of property owned or product produced by the corporation.

the company's stock price, whereas decreases in dividends are viewed quite unfavorably and are associated with decreases in the company's stock price. It is observed that many corporations that do pay cash dividends only reluctantly lower or eliminate cash dividends. It is often the case, however, that relatively young, fast-growing companies do not pay dividends; as the companies mature they begin to pay dividends.[3]

At one time, dividend payments were taxed solely as ordinary income. Ordinary income means that the tax rate applicable is based on the investor's regular marginal tax bracket. However, to stimulate the stock market, the tax law was changed so that dividends are taxed as either ordinary income or as **qualified dividends**. The advantage of having dividends treated as qualified dividends is that they are subject to a preferential tax rate. More specifically, depending on the individual's income tax rate, qualified dividends are taxed at either 5% or 15%. If the individual has a regular income tax rate greater than or equal to 25%, then the qualified dividend tax rate is 15%. If the individual's regular income tax rate is less than 25%, then the qualified dividend tax rate is 5%. The Internal Revenue Code (IRC) sets forth the rule to determine whether dividends are qualified. Specifically, the IRC states that the investor "must have held the stock for more than 60 days during the 121-day period that begins 60 days before the ex-dividend date."

The change in the price of the common stock determines whether there is a gain or loss. If the price at a future date exceeds the purchase price, then there is a capital gain; if the price at a future date is less than the purchase price, then there is a capital loss. When an investor is calculating the return from holding common stock from the date of purchase to a given point in time but has not sold the common stock, the return reflects an unrealized capital gain or unrealized capital loss. The investor does not pay any tax on the capital gain or capital loss until the stock is sold. Once the stock is sold, the IRC specifies how the capital gain or capital loss is to be treated. The treatment depends on whether the investment is determined as "short term" or "long term." The IRC defines *short term* as a holding period of one year or less. If a capital gain is classified as a short-term capital gain, it is taxed as ordinary income at the investor's regular income tax rate. *Long term* is defined as holding an investment for more than one year. A long-term capital gain is taxed at a preferential tax rate in the same way as qualified dividends: either 5% or 15% depending on the individual investor's regular income tax rate.

Key Points That You Should Understand Before Proceeding

1. What an equity security is.
2. The difference between common stock and preferred stock.
3. The two potential sources of return from investing in common stock and their tax treatment.

TRADING MECHANICS

We begin with the key features involved in trading stocks. Later in the chapter, we discuss trading arrangements (block trades and program trades) that were developed specifically for coping with the trading needs of institutional investors.

[3] How much of a corporation's profit to pay out versus retain is called the corporation's "dividend policy," and the factors that influence that decision are covered in corporate finance courses.

Types of Orders

When an investor wants to buy or sell a share of common stock, the price and conditions under which the order is to be executed must be communicated to a broker. The simplest type of order is the **market order**, an order to be executed at the best price available in the market. The danger of a market order is that an adverse move may take place between the time the investor places the order and the time the order is executed. To avoid this danger, the investor can place a *limit order* that designates a price threshold for the execution of the trade. A *buy limit order* indicates that the stock may be purchased only at the designated price or lower. A *sell limit order* indicates that the stock may be sold at the designated price or higher. The key disadvantage of a limit order is that there is no guarantee that it will be executed at all; the designated price may simply not be obtainable. A limit order that is not executable at the time it reaches the market is recorded in a **limit order book**.

The limit order is a *conditional order*. It is executed only if the limit price or a better price can be obtained. Another type of conditional order is the **stop order**, which specifies that the order is not to be executed until the market moves to a designated price, at which time it becomes a market order. A *buy stop order* specifies that the order is not to be executed until the market rises to a designated price; that is, until it trades at or above, or is bid at or above, the designated price. A *sell stop order* specifies that the order is not to be executed until the market price falls below a designated price, that is, until it trades at or below, or is offered at or below, the designated price. A stop order is useful when an investor cannot watch the market constantly. Profits can be preserved or losses minimized on a stock position by allowing market movements to trigger a trade. In a sell (buy) stop order, the designated price is lower (higher) than the current market price of the stock. In a sell (buy) limit order, the designated price is higher (lower) than the current market price of the stock. The relationships between the two types of conditional orders, and the market movements that trigger them, appear in Table 1.

Two dangers are associated with stop orders. Stock prices sometimes exhibit abrupt price changes, so the direction of a change in a stock price may be quite temporary, resulting in the premature trading of a stock. Also, once the designated price is reached, the stop order becomes a market order and is subject to the uncertainty of the execution price noted earlier for market orders.

A stop-limit order, a hybrid of a stop order and a limit order, is a stop order that designates a price limit. In contrast to the stop order, which becomes a market order if the stop is reached, the stop-limit order becomes a limit order if the stop is reached. The stop-limit order can be used to cushion the market impact of a stop order. The investor can limit the possible execution price after the activation of the stop. As with a limit order, the limit price may never be reached after the order is activated, which therefore defeats one purpose of the stop order—to protect a profit or limit a loss.

An investor can also enter a **market if touched order**. This order becomes a market order if a designated price is reached. A market if touched order to buy becomes a market order if the market falls to a given price, whereas a stop order to buy becomes a market order if the market rises to a given price. Similarly, a market if touched order to sell becomes a market order if the market rises to a specified price, while the stop order to sell becomes a market order if the market falls to a given price. We can think of the stop order as an order

Table 1 Conditional Orders for the Direction of the Next Trade

Price of Security	Limit Order	Market if Touched Order	Stop-Limit Order	Stop Order
Higher price	Price specified for a sell limit order	Price specified for a sell market if touched order	Price specified for a buy stop-limit order	Price specified for a buy stop order
Current price	—	—	—	—
Lower price	Price specified for a buy limit order	Price specified for a buy market if touched order	Price specified for a sell stop-limit order	Price specified for a sell stop order
Comment	Can be filled only at price or better; that is, does not become a market order when price is reached	Becomes market order when price is reached	Does not become a market order when price is reached; can be executed only at price or better	Becomes market order when price is reached

designed to get out of an existing position at an acceptable price (without specifying the exact price), and the market if touched order as an order designed to get into a position at an acceptable price (also without specifying the exact price).

Orders can be placed to buy or sell at the open or the close of trading for the day. An *opening order* indicates a trade to be executed only in the opening range for the day, and a *closing order* indicates a trade is to be executed only within the closing range for the day.

An investor may enter orders that contain order cancellation provisions. A **fill or kill order** must be executed as soon as it reaches the trading floor or it is immediately canceled. Orders may designate the time period for which the order is effective: a day, week, or month, or perhaps by a given time within the day. An **open order**, or *good till canceled order*, is good until the investor specifically terminates the order.

Orders are also classified by size. The normal unit of trading for common stock is typically a **round lot**, which is 100 shares of a stock. An **odd lot** is defined as less than a round lot. A **block trade** refers to a large dollar amount or number of shares of a given stock. For example, the New York Stock Exchange (NYSE) defines a block trade as an order of 10,000 shares of a given stock or a total market value of $200,000 or more.

Short Selling

Short selling involves the sale of a security not owned by the investor at the time of sale. Investors can arrange to have their broker borrow the stock from someone else, and the borrowed stock is delivered to implement the sale. To cover their short position, investors must subsequently purchase the stock and return it to the party that lent the stock.

Let us look at an example of how this is done in the stock market. Suppose that on March 17, 2008, Ms. Stokes believes that the common stock of General Motors Corporation (ticker symbol GM) is overpriced at $18.30 per share and wants to be in a position to benefit if her assessment is correct. Ms. Stokes calls her broker, Mr. Yats, indicating that she wants

to sell 100 shares of GM. Mr. Yats will do two things: (1) sell 100 shares of GM on behalf of Ms. Stokes, and (2) arrange to borrow 100 shares of GM to deliver to the buyer. Suppose that Mr. Yats is able to sell the stock for $18.30 per share and borrows the stock from Mr. Jordan. The shares borrowed from Mr. Jordan will be delivered to the buyer of the 100 shares. The proceeds from the sale (ignoring commissions) will be $1,830. However, the proceeds do not go to Ms. Stokes because she has not given her broker the 100 shares of GM. Thus, Ms. Stokes is said to be "short 100 shares of GM."

Now, let's suppose one week later the price of GM stock declines to $15 per share. Ms. Stokes may instruct her broker to buy 100 shares of GM. The cost of buying the shares (once again ignoring commissions) is $1,500. The shares purchased are then delivered to Mr. Jordan, who lent 100 shares of GM to Ms. Stokes. At this point, Ms. Stokes has sold 100 shares and bought 100 shares of GM stock. So, she no longer has any obligation to her broker or to Mr. Jordan; she has "covered" her short position. She is entitled to the funds in her account that were generated by the selling and buying activity. She sold the stock for $1,830 and bought it for $1,500. Thus, she realizes a profit before commissions of $330. From this amount, commissions are subtracted.

Two more costs will reduce the profit further. First, a fee will be charged by the lender of the stock. We will discuss this fee shortly. Second, if there are any dividends paid by GM while the stock is borrowed, Ms. Stokes must compensate Mr. Jordan for the dividends to which he would have been entitled.

If instead of falling, the price of GM stock rises, Ms. Stokes will realize a loss when she is forced to cover her short position. For example, if the price rises to $24.30, Ms. Stokes will lose $500, to which must be added commissions and the cost of borrowing the stock (and possibly dividends).

Margin Transactions

Investors can borrow cash to buy securities and use the securities themselves as collateral. For example, suppose Mr. Huang has $10,000 to invest and is considering buying GM on March 17, 2008, at $18.30 per share. With his $18,300, Mr. Huang can buy 1,000 shares (ignoring commissions). Suppose Mr. Huang's broker can arrange for him to borrow an additional $18,300 so that he can buy an additional 1,000 shares. Thus, with a $36,600 investment, he can purchase a total of 2,000 shares. The 2,000 shares will be used as collateral for the $18,300 borrowed, and Mr. Huang will have to pay interest on the amount borrowed.

A transaction in which an investor borrows to buy shares using the shares themselves as collateral is called **buying on margin**. By borrowing funds, an investor creates financial leverage. Note that Mr. Huang, for an $18,300 investment, realizes the consequences associated with a price change of 2,000 shares rather than 1,000 shares. He will benefit if the price rises but be worse off if the price falls (compared to borrowing no funds).

To illustrate, we now look at what happens if the price subsequently changes. If the price of GM stock rises to $27.30 per share, ignoring commissions and the cost of borrowing, Mr. Huang will realize a profit of $9 per share on 2,000 shares, or $18,000. Had Mr. Huang not borrowed $18,300 to buy the additional 1,000 shares, his profit would be only $9,000. Suppose, instead, the price of GM stock decreases to $11.30 per share. Then, by borrowing to buy 500 additional shares, Mr. Huang lost $7 per share on 2,000 shares instead of $7 per share on just 1,000 shares.

The funds borrowed to buy the additional stock will be provided by the broker, and the broker gets the money from a bank. The interest rate that banks charge brokers for funds of this purpose is called the **broker call rate** or **call money rate**. For example, on March 17, 2008, the broker call rate was 4.75%. The broker charges the borrowing investor the call money rate plus a service charge.

Brokers are not free to lend as much as they wish to the investor to buy securities. The Securities Exchange Act of 1934 prohibits brokers from lending more than a specified percentage of the market value of the securities. The **initial margin requirement** is the proportion of the total market value of the securities that the investor must pay as an equity share, and the remainder is borrowed from the broker. The 1934 Act gives the Board of Governors of the Federal Reserve (the Fed) the responsibility to set initial margin requirements, which it does under Regulations T and U. The Fed changes margin requirements as an instrument of economic policy. The initial margin requirement for common stock has been below 40%; it was 50% as of March 2008. Initial margin requirements vary for stocks and bonds.

The Fed also establishes a **maintenance margin requirement**. This is the minimum proportion of (1) the equity in the investor's margin account to (2) the total market value. If the investor's margin account falls below the minimum maintenance margin (which would happen if the share's price fell), the investor is required to put up additional cash. The investor receives a margin call from the broker specifying the additional cash to be put into the investor's margin account. If the investor fails to put up the additional cash, the broker has the authority to sell the securities for the investor's account. As of March 2008, the maintenance margin requirement was 30%.

Let us illustrate the maintenance margin requirement. Assume an investor buys 100 shares of a stock at $60 per share for $6,000 of stock on 50% margin and the maintenance margin is 30%. By purchasing $6,000 of a stock on 50% margin, the investor must put up $3,000 of cash (or other equity) and, thus, borrows $3,000 (referred to as the "debit balance"). The investor, however, must maintain 30% margin. To what level must the stock price decline to hit the maintenance margin level? The price is $42.86. At this price, the stock position has a value of $4,286 ($42.86 × 100 shares). With a loan of $3,000, the equity in the account is $1,286 ($4,286 − $3,000), or 30% of the account value ($1,286/$4,286 = 30%). If the price of the stock decreases below $42.86, the investor must deposit more equity to bring the equity level up to 30%.

There are also margin practices for short selling. Consider a similar margin example for a short position. An investor shorts (borrows and sells) 100 shares of a stock at $60 for a total stock value of $6,000. With an initial margin of 50%, the investor must deposit $3,000 (in addition to leaving the $6,000 from the sale in the account). This leaves the investor with a credit balance of $9,000 (which does not change with the stock price since it is in cash). However, the investor owes 100 shares of the stock at the current market price. To what level must the stock price increase to hit the maintenance margin level, assumed to be 30% (which is the equity in the account as a percentage of the market value of the stock)? The answer is $69.23, for a total stock value of $6,923. If the stock is worth $6,923, there is $2,077 of equity in the account ($9,000 − $6,923), which represents 30% of the market value of the stock ($2,077/$6,923 = 30%). The value of the stock that triggered the maintenance level is calculated by multiplying the credit balance by 10/13 (10/13 × $9,000 = $6,923).

Key Points That You Should Understand Before Proceeding

1. The different types of orders that can be placed when purchasing common stock and the advantages and disadvantages of each type.
2. The mean of selling short and the mechanisms for doing so.
3. What margin transactions are and the mechanics of buying on margin.
4. The risks associated with short selling and margin transactions.

TRANSACTION COSTS

An important aspect of an investment strategy is controlling the transaction costs necessary to implement the strategy. **Transaction costs**, also referred to as **trading costs**, can be decomposed into two major components: explicit costs and implicit costs. *Explicit costs* are the direct costs of trading, such as broker commissions, fees, and taxes. *Implicit costs* represent such indirect costs as the price impact of the trade and the opportunity costs of failing to execute in a timely manner or at all. Whereas explicit costs are associated with identifiable accounting charges, no such reporting of implicit costs occurs.

Explicit Costs

The main explicit cost is the commission paid to the broker for execution. Commission costs are fully negotiable and vary systematically by broker type and market mechanism. The commission may depend on both the price per share and the number of shares in the transaction.[4] In addition to commissions, there may be other explicit costs. These explicit costs include *custodial fees* (the fees charged by an institution that holds securities in safekeeping for an investor) and *transfer fees* (the fees associated from transferring an asset from one owner to another).

Soft Dollars

Investors often choose their broker/dealer based on who will give them the best execution at the lowest transaction cost on a specific transaction, and also based on who will provide complementary services (such as research) over a period of time. Order flow can also be "purchased" by a broker/dealer from an investor with **soft dollars**. In this case, the broker/dealer provides the investor, without explicit charge, services such as research or electronic services, typically from a third party for which the investor would otherwise have had to pay "hard dollars" to the third party, in exchange for the investor's order flow. Of course, the investor pays the broker/dealer for the execution service.

According to such a relationship, the investor preferentially routes their order to the broker/dealer specified in the soft dollar relationship and does not have to pay "hard dollars," or real money, for the research or other services. This practice is called paying "soft dollars" (i.e., directing their order flow) for the ancillary research. For example, client A preferentially directs his order flow to broker/dealer B (often a specified amount of order flow over a specified period, such as a month or year) and pays the broker/dealer for these execution services. In turn, broker/dealer B pays for some research services provided to

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[4] For more on this point, see Bruce M. Collins and Frank J. Fabozzi, "A Methodology for Measuring Transactions Costs," *Financial Analysts Journal* (March/April 1991), pp. 27–36.

client A. Very often the research provider is a separate firm, say, firm C. Thus, soft dollars refer to money paid by an investor to a broker/dealer or a third party through commission revenue rather than by direct payments.

The disadvantage to the broker/dealer is that they have to pay hard dollars (to the research provider) for the client's order flow. The disadvantage to the client is that they are not free to "shop around" for the best bid or best offer, net of commissions, for all their transactions, but have to do an agreed amount of transaction volume with the specific broker/dealer. In addition, the research provider may give a preferential price to the broker/dealer. Thus, each of these participants in the soft dollar relationship experiences some advantage, but also an offsetting disadvantage.

The SEC has imposed formal and informal limitations on the type and amount of soft dollar business institutional investors can conduct. For example, while an institutional investor can accept research in a soft dollar relationship, they cannot accept furniture or vacations. SEC disclosure rules, passed in 1995, require investment advisors to disclose, among other things, the details on any product or services received through soft dollars.[5]

Implicit Costs

Implicit trading costs include impact costs, timing costs, and opportunity costs.

Impact Costs

The impact cost of a transaction is the change in market price due to supply/demand imbalances caused by the presence of the trade. Bid–ask spread estimates, although informative, fail to capture the fact that large trades—those that exceed the number of shares the market maker is willing to trade at the quoted bid and ask prices—may move prices in the direction of the trade. That is, large trades can increase the price for buy orders and decrease the price for sell orders. The resulting *market impact* or *price impact* of the transaction can be thought of as the deviation of the transaction price from the "unperturbed price" that would have prevailed had the trade not occurred. As discussed previously, crossing networks are designed to minimize impact costs.

Timing Costs

The timing cost is measured as the price change between the time the parties to the implementation process assume responsibility for the trade and the time they complete the responsibility. Timing costs occur when orders are on the trading desk of a buy-side firm (e.g., an asset mangement firm) but have not been released to the broker because the trader fears that the trade may swamp the market.

Opportunity Costs

The *opportunity cost* is the "cost" of securities not traded. This cost results from missed or only partially completed trades. These costs are the natural consequence of the release delays. For example, if the price moves too much before the trade can be completed, the manager will not make the trade. In practice, this cost is measured on shares not traded based on the difference between the market price at the time of decision and the closing price 30 days later.

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[5] The CFA Institute has published standards that provide guidance as to how investment professionals should utilize soft dollars in a manner that benefits clients.

Whereas commissions and impact costs are actual and visible out-of-pocket costs, opportunity costs and timing costs are the costs of foregone opportunities and are invisible. Opportunity costs can arise for two reasons. First, some orders are executed with a delay, during which the price moves against the investor. Second, some orders incur an opportunity cost because they are only partially filled or are not executed at all.

Key Points That You Should Understand Before Proceeding

1. There are two major components of transaction costs: explicit costs and implicit costs.
2. Explicit transaction costs are commissions, custodial fees, and transfer fees.
3. What a soft dollar arrangement is.
4. Implicit trading costs include impact costs, timing costs, and opportunity costs.

TRADING ARRANGEMENTS FOR RETAIL AND INSTITUTIONAL INVESTORS

Trades are executed by both individuals, called retail investors, and institutions. There are several differences in the way they trade. The first is size: Institutions typically transact much larger orders than individuals. The second is commissions: Consistent with their larger size, institutions typically pay lower commissions than individuals.

The third difference is the method of order execution. Although both an individual and an institution can trade through a broker-dealer, the ways in which their orders are entered and executed may be considerably different, even if the trades are through the same broker-dealer. An individual trading through a broker-dealer typically goes through a stockbroker. In the next chapter, we will see how these trades are executed.

Institutional investors typically give their order directly to the institutional broker-dealer execution desk, for both exchange and OTC orders. Exchange orders may be sent to the broker-dealer's floor broker, and OTC orders may be transacted with another broker-dealer or internalized (which we will explain in the next chapter) at a competitive bid or offer. Competing bids or offers are typically obtained in all cases.

Because of these differences in the execution of stock trades by individuals and institutions, the trends in common stock holdings is of consequence. During the past 50 years, common stock holdings in the United States have become increasingly institutionalized. The major institutional holders are pension funds (private [usually corporate], state and local government [called public], and labor union), asset management companies (investment companies and hedge funds), life insurance companies, bank trusts, endowments, and foundations.

Historically, there has been a decline in the direct household ownership of common stocks. This decline does not necessarily lead to the conclusion that households have decreased their common stock holdings. Rather, it means that households ~~are holding~~ more of their common stock through intermediaries such as mutual funds rather than directly in the form of common stock. Thus, households have "intermediated" their stock holdings. Although households hold more total common stock than before, they hold less common stock directly, and, thus, increasingly the stock executions are done by institutions, such as mutual funds, rather than by individuals.

Retail Stock Trading

Since May Day 1975, stock trading commissions have declined both for institutions and individuals. However, prior to about 1990, individuals traded stocks mainly through so-called "full-service brokers," where their commissions reflected not only the stock trade execution but also the counsel of a stockbroker and perhaps research. The largest full-service broker-dealers are also known as "wirehouses." These firms typically do institutional trading and investment banking as well as retail business. The commissions for these full-service brokers have declined since 1975.

A discount broker industry has also developed in which the stockbroker provides advice and no research. Individuals enter their orders via a telephone. More recently, individuals have been able to enter their orders via their computer: These are called online or Web-based brokerage firms. Consistent with the lower provision of service by discount brokers and online brokers, stock trading commissions decreased significantly. Thus, individuals could trade and own stocks more efficiently.

To remain competitive to a wide range of clients in this environment, the traditional full-service brokerage firms responded by offering their customers alternative means of transacting common stock. For example, many full-service brokerage firms offer the traditional services of a stockbroker and research at a high commission, and, in addition, offer direct order entry only at a lower commission. On the other hand, some discount brokers have begun to offer more service at a higher commission.

Institutional Trading

With the increase in trading by institutional investors, trading arrangements more suitable to these investors had to be developed. Their needs included trading in large size and trading groups of stocks, both at a low commission and with low market impact. This has resulted in the evolution of special arrangements for the execution of certain types of orders commonly sought by institutional investors: (1) orders requiring the execution of a trade of a large number of shares of a given stock, and (2) orders requiring the execution of trades in a large number of different stocks at as near the same time as possible. The former types of trades are called block trades; the latter are called program trades. An example of a block trade is a mutual fund that seeks to buy 15,000 shares of IBM stock. An example of a program trade is a pension fund that wants to buy shares of 200 names (companies) weighted by their market capitalization at the end of a trading day ("at the close").

The institutional arrangement that has evolved to accommodate these two types of institutional trades is the development of a network of trading desks of the major securities firms and other institutional investors who communicate with each other by means of electronic display systems and telephones. This network is referred to as the upstairs market. Participants in the upstairs market play a key role (1) by providing liquidity to the market so that such institutional trades can be executed, and (2) by arbitrage activities that help to integrate the fragmented stock market. We will have more to say about the upstairs market in the next chapter.

Block Trades

As noted previously in this chapter, the NYSE defines block trades as trades of either at least 10,000 shares of a given stock or trades of shares with a market value of at least $200,000, whichever is less. Since the execution of large numbers of block orders places strains on the

NYSE's specialist system (which is explained in the next chapter), special procedures have been developed to handle them. Typically, an institutional customer contacts its salesperson at a brokerage firm, indicating that it wishes to place a block order. The salesperson then gives the order to the brokerage firm's block execution department. Notice that the salesperson does not submit the order to be executed to an exchange. The sales traders in the block execution department then contact other institutions to attempt to find one or more institutions that would be willing to take the other side of the order. That is, they use the upstairs market in their search to fill the block trade order. If this can be accomplished, the execution of the order is completed.

If the sales traders cannot find enough institutions to take the entire block (for example, if the block trade order is for 40,000 shares of IBM, but only 25,000 can be "crossed" with other institutions), then the balance of the block trade order is given to the brokerage firm's market maker. There are two choices. First, the brokerage firm can take a position in the stock and buy the shares for its own account. Second, the unfilled order can be executed by using the services of competing market makers. In the former case, the brokerage firm is committing its own capital.

Program Trades

Program trades involve the buying and/or selling of a large number of names simultaneously. Such trades are also called **basket trades** because effectively a "basket" of stocks is being traded. The NYSE defines a program trade as any trade involving the purchase or sale of a basket of at least 15 stocks with a total value of $1 million or more.

The two major applications of program trades are asset allocation and index arbitrage. With respect to asset allocation trades, some examples of why an institutional investor may want to use a program trade are deployment of new cash into the stock market; implementation of a decision to move funds invested in the bond market to the stock market (or vice versa); and rebalancing the composition of a stock portfolio because of a change in investment strategy. A mutual fund money manager can, for example, move funds quickly into or out of the stock market for an entire portfolio of stocks through a single program trade. All these strategies are related to asset allocation.

The growth of mutual fund sales and massive equity investments by pension funds, hedge funds, and insurance companies during the 1990s have all given an impetus to such methods to trade baskets or bundles of stocks efficiently. Other reasons for which an institutional investor may have a need to execute a program trade should be apparent later when we discuss an investment strategy called indexing.

Program trading is also used for a strategy called index arbitrage. The price of a stock index futures contract is derived from the underyling cash product, namely the stocks included in the stock index. Specifically, there is a mathematical relationship between the price of the stock index futures contracts and the value of the stocks included in the index taking into account transaction costs and the cost of borrowing funds. This relationship establishes bounds for the price of the stock index futures contract. When the price of the stock index futures contract deviates from these bounds, there is an opportunity for a riskless profit by trading the two. For example, suppose that the price of the S&P 500 futures contract is higher than the upper bound established by the cash market price of the basket of 500 stocks and transaction costs and borrowing costs. Then, it would be

profitable to sell the index in the futures market and buy the basket in the cash market. To the NYSE specialists, this would show up as a large simultaneous purchase of all stocks in the S&P 500 index. Index fund managers sometimes use program trades to choose between taking a position in the stock market by buying or selling stock or by buying or selling stock index futures contracts.

Several commission arrangements are available to an institution for a program trade, and each arrangement has numerous variants. Considerations in selecting one (in addition to commission costs) are the risks of failing to realize the best execution price and that the brokerage firms executing the program trade will use their knowledge of the program trade to benefit from the anticipated price movement that might result—in other words, that they will **frontrun** the transaction, for example, buying a stock for their own account before filling the customer buy order.

From a dealer's perspective, program trades can be conducted in two ways, namely, on an *agency basis* and on a *principal basis*. An intermediate type of program trade, the agency incentive arrangement, is also an alternative. A program trade executed on an agency basis involves the selection by the investor of a brokerage firm solely on the basis of commission bids (cents per share) submitted by various brokerage firms. The brokerage firm selected uses its best efforts as an agent of the institution to obtain the best price. Such trades have low explicit commissions. To the investor, the disadvantage of the agency program trade is that, while commissions may be the lowest, the execution price may not be the best because of impact costs and the potential frontrunning by the brokerage firms that were solicited to submit a commission bid. The investor knows in advance the commission paid but does not know the price at which its trades will be executed. Another disadvantage is that there is increased risk of adverse selection of the counterparty in the execution process.

Related to the agency basis is an *agency incentive arrangement*, in which a benchmark portfolio value is established for the group of stocks in the program trade. The price for each "name" (i.e., specific stock) in the program trade is determined as either the price at the end of the previous day or the average price of the previous day. If the brokerage firm can execute the trade on the next trading day such that a better-than-benchmark portfolio value results—a higher value in the case of a program trade involving selling, or a lower value in the case of a program trade involving buying—then the brokerage firm receives the specified commission plus some predetermined additional compensation. In this case, the investor does not know in advance the commission or the execution price precisely but has a reasonable expectation that the price will be better than a threshold level.

What if the brokerage firm does not achieve the benchmark portfolio value? It is in such a case that the variants come into play. One arrangement may call for the brokerage firm to receive just a previously agreed-upon commission. Other arrangements may involve sharing the risk of not realizing the benchmark portfolio value with the brokerage firm. That is, if the brokerage firm falls short of the benchmark portfolio value, it must absorb a portion of the shortfall. In these risk-sharing arrangements, the brokerage firm is risking its own capital. The greater the risk-sharing that the brokerage firm must accept, the higher the commission it will charge.

The brokerage firm can also choose to execute the trade on a principal basis. In this case, the dealer would commit its own capital to buy or sell the portfolio and complete the investor's transaction immediately. Since the dealer incurs market risk, it would also charge higher commissions. The key factors in pricing principal trades are liquidity characteristics,

absolute dollar value, nature of trade, customer profile, and market volatility. In this case, the investor knows the trade execution price in advance but pays a higher commission.

To minimize frontrunning, institutions often use other types of program trade arrangements. They call for brokerage firms to receive aggregate statistical information about key portfolio parameters rather than specific names and quantities of stocks. Several brokerage firms then bid on a cents-per-share basis on the entire portfolio (also called blind baskets), guaranteeing execution at either closing price (termed market-at-close) or a particular intra-day price to the customer. Note that this is a principal trade. Since mutual fund net asset values are calculated using closing prices, a mutual fund that follows an indexing strategy (i.e., an index fund), for instance, would want guaranteed market-at-close execution to minimize its risk of not performing as well as the stock index. When the winning bidder has been selected, it receives the details of the portfolio. Although the commission in this type of transaction is higher, this procedure increases the risk to the brokerage firm of successfully executing the program trade. However, the brokerage firm can use stock index futures to protect itself from market-wide movements if the characteristics of the portfolio in the program trade are similar to the index underlying the stock index futures contract.

Brokerage firms can also execute the trade in the upstairs market or send orders electronically to an exchange. The counterparties in program trades are viewed as uninformed traders; that is, the entity asked to execute the order knows that the trade is being made for index-wide or portfolio-wide reasons and not stock-specific reasons. Such trades are called *informationless trades.*

Key Points That You Should Understand Before Proceeding

1. The reasons retail stock trading has become more attractive.
2. What block trading and program trading are and how they accommodate the trading needs of institutional investors.
3. The different types of commission arrangements for program trades.
4. The meaning of the term frontrunning and how institutional investors can avoid this problem.

BASIC FUNCTIONING OF STOCK MARKETS

In this section, we describe the basic functioning of stock markets, which includes:

- price reporting
- regulation
- clearance and settlement
- tick size
- block trade
- commissions
- price limits and collars

Price Reporting

Price reporting in the U.S. stock markets is conducted by the Consolidated Tape Association (CTA). The CTA oversees the dissemination of real-time trade and quote information (market data) from the NYSE and Amex listed securities (stocks and bonds).

The CTA is an independent, industry-wide organization. CTA manages two systems to govern the collection, processing, and dissemination of trade and quote data. The two systems are the Consolidated Tape System (CTS), which governs trades, and the Consolidated Quotation System (CQS), which governs quotes. Since the late 1970s, all SEC-registered exchanges and market centers that trade NYSE or Amex-listed securities send their trades and quotes to a central consolidator where the CTS and CQS data streams are produced and distributed worldwide.

The data collected by the CTA are provided on two networks, Network A (or Tape A) for NYSE-listed securities that is administered by the NYSE and Network B (or Tape B) for Amex and regional exchange-listed securities that is administered by the Amex. Nasdaq operates a similar tape for its listed securities, which is called Network C (or Tape C).

CTS is the electronic service that provides last sale and trade data for issues listed on the NYSE, Amex, and U.S. regional stock exchanges and was introduced in April 1976. CTS is the basis for the trade reports from the consolidated tape that runs across television screens on financial news programs or on the Internet sites. The "consolidated tape" is a high-speed, electronic system that constantly reports the latest price and volume data on sales of exchange-listed stocks.

CQS is the electronic service that provides quotation information for issues listed on the NYSE, Amex, and U.S. regional stock exchanges that are discussed in the next section. For every quote message received from a market center, CQS calculates a national best bid and offer (NBBO) based on a price, size, and time priority schema. We will explain the meaning of BBO in the next chapter. If the quote is a Nasdaq market maker quote, CQS also calculates a Nasdaq BBO. CQS disseminates the market center's root quote with an appendage that includes the National and Nasdaq BBOs.

In general, Tapes A and B are referred to as the "CTS Tapes" and Tape C as the "Nasdaq Tapes."

Regulation

The basis for the federal government regulation of the stock market resides with the SEC. The SEC's authority is primarily based on two important pieces of federal legislation. The first is the Securities Act of 1933 (the "Securities Act"), which covers the primary markets, that is, the new issues of securities. The second is the Securities Act of 1934 (the "Exchange Act"), which covers the secondary markets. The SEC was created by the Exchange Act.

In addition to the SEC regulations, the exchanges also play a role in their own regulation through self-regulating organizations (SROs). The SRO of the NYSE has been responsible for the member regulation, enforcement, and arbitration functions of the NYSE. In addition, the NASD has had the SEC authority to set standards for its member firms and standards of conduct for issuing securities and selling securities to the public. The NASD has also monitored the Nasdaq stock market. There have, however, been some overlapping responsibilities of these two SROs and, thus, some competition between them.

As a result, these two SROs merged and in July 2007 were replaced by a single organization, FINRA (the Financial Industry Regulation Authority), which consolidated the NASD and the member regulation, enforcement, and arbitration functions of NYSE. This consolidation resulted in all firms dealing with only one rulebook, one set of examiners,

and one enforcement staff, thereby reducing costs and inconsistencies. Thus, FINRA is the single remaining SRO.

Clearance and Settlement

After a stock trade is completed, the delivery of the shares by the seller and the payment of cash by the buyer must occur quickly and efficiently. The efficiency of the trade settlement affects the total speed and the overall cost of the transaction. In the United States, there are several execution mechanisms (exchanges and other) for stocks. There is, however, only a single clearance and settlement mechanism for securities, the Depository Trust and Clearing Corporation (DTTC). In stock options, similarly, there is only one clearing mechanism, the Options Clearing Corporation (OCC).

In the futures markets, however, there are several clearing organizations, each typically associated with the related exchange. This control over clearing by futures exchanges makes it easier for them to preserve their monopolies in trading and also gives them a significant source of profitability. During February 2008, however, the U.S. Department of Justice questioned whether futures exchanges should be allowed to own or control clearing businesses that process their trades. The issue is whether futures clearing will become centralized like stock and options clearing.

All clearance and settlement services for the U.S. equities market (as well as corporate bonds, municipal bonds, exchange-traded funds, and unit investment trusts trades) are provided by the National Securities Clearance Corporation (NSCC). NSCC is a wholly owned subsidiary of the DTCC. NSCC generally clears and settles trades on a T+3 basis (that is, three business days after the trade date). DTCC is essentially a utility organization for the exchanges.

Other subsidiaries of DTCC provide clearance and settlement for other products and also trust services.

Tick Size

The minimum price variation for a security is referred to as its **tick size**. The U.S. stock market historically had a tick size of 1/8th of one point. The SEC wanted to reduce the bid–offer spread to increase the competition and lower costs. As a result, the NYSE and Nasdaq reduced the tick size first to 1/16th and then, in 2001, to pennies (1 cent).

This reduction in the tick size narrowed the bid–offer spread considerably, which reduced the costs to customers and the profits of the market makers. In addition, as an unintended consequence, it negatively affected the liquidity of the market. With pennies there are 100 pricing points per dollar, while with eights there are only eight. So with pennies, there is less liquidity at each pricing point and so there is less depth at the inside market (the best bid and best offer or the "top of the book"). (We will describe what is meant by the inside market in the next chapter.) Since only the top of the book is displayed, the advent of pennies reduced transparency and was one of the reasons for the development of dark pools, as discussed in the next chapter.

In addition, with pennies, quotes (bids or offers) are changed more frequently, and so the technology must have lower *latency*. Low latency, that is, a small amount of time necessary to complete an instruction, means high speed. Latency below 1 millisecond is now common. As indicated above, the advent of pennies is one reason for the development and growth of algorithmic trading, discussed in the next chapter. Sub-penny pricing is prohibited except for the stocks that trade for less than a dollar.

Block Trades

A *block* is a large holding or transaction of stock, generally 10,000 or more shares or any amount over $200,000. In a *block trade* (a "block facilitation trade") a broker-dealer commits capital to accommodate a large trade for an institutional customer. These trades are conducted "upstairs" (off the exchange) and "shown to" the market, for potential price improvement. Block trades are reported through the standard price reporting systems. With the growth in algorithmic trading, however, blocks that have traditionally been accomplished "upstairs" via internalization are now accomplished via algorithmic trading.

Commissions

Before 1975, stock exchanges were allowed to set minimum commissions on transactions. The fixed-commission structure did not allow the commission rate to decline as the number of shares in the order increased, thereby ignoring the economies of scale in executing transactions.

Pressure from institutional investors, who transacted large trades, led the SEC to eliminate fixed-commission rates in 1975. Since May 1, 1975, popularly referred to as Black Thursday (or May Day as previously indicated), commissions have been fully negotiable between investors and their brokers. Black Thursday began a period of severe price competition among brokers, with many firms failing, and a consolidation of firms taking place in the brokerage industry. This liberalization of commissions was the U.S. version of the "Big Bang," which was followed in the United Kingdom during 1986 and Japan during 1996.

Since the introduction of negotiated commissions, the opportunity has arisen for the development of discount brokers. These brokers charge commissions at rates much less than those charged by other brokers, but offer little or no advice or any other service apart from the execution of the transaction. Discount brokers have been particularly effective in inducing retail investors to participate in the market for individual stocks.

Price Limits and Collars

On Monday, October 19, 1987, popularly referred to as "Black Monday," the U.S. stock market experienced the largest single-day decline in its history at that time. (The largest decline occurred on September 29, 2008.) This event is often referred to simply as "the crash." On that day, a popular market index that we discuss later in this chapter, the Dow Jones Industrial Average (DJIA), declined by 23%, and other market indexes declined by roughly the same amount.

Afterward, the U.S. government and some exchanges commissioned several studies to assess the causes of the crash and to offer possible remedial measures to prevent any recurrence. Several government-sponsored studies and exchange-sponsored studies were conducted, including a study by a presidential task force that became known as the Brady Report.[6] These studies explained the crash as the result of (1) deficiencies in institutional arrangements in stock trading, (2) an overvaluation of stock prices, and (3) various forms of overreaction to economic news.

While several potential reasons for the crash were identified, no unambiguous conclusions resulted. One clear dynamic for the price decline, however, did exist. This dynamic

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[6] Brady Report, *Presidential Task Force on Market Mechanisms*, 1988.

was that selling caused price declines, which caused further selling, and so on. (The opposite dynamic of "buying on dips" occurs when price declines cause buying rather than selling, which became more common after the crash.) Two potential reasons explain why price declines cause further selling. One is emotional; that is, price declines cause fear, which causes further selling. The second is a trading strategy, used by some institutional investors, that exacerbates any plunge in the market.[7] A stock market policy called *trading limits* or *price limits* resulted from Black Monday. Trading or price limits specify a minimum price limit, below which the market price index level may not decline due to an institutionally mandated termination of trading, at least at prices below the specified price (the price limit), for a specified period of time. For example, if the DJIA was trading at 11,000 and its price limit was 500 points below that, then no trades could occur below 10,500. This pause in trading is intended to "give the market a breather" to at least calm emotions. Previously, trading limits were used in the futures markets but not in the stock market.

Soon after the crash, the NYSE and other exchanges implemented these price limits, which they modified several times, bringing limits to their present design. Two different types of price limits are circuit breakers and trading collars. We discuss each below.

Circuit Breaker Rule

A circuit breaker is a temporary halting of trading during a severe market decline. The key to instituting circuit breakers is coordination and infrequency. As stated by the Working Group on Financial Markets, which included the high-level representatives of the SEC, U.S. Treasury, Federal Reserve Board, and Commodity Futures Trading Commision:

> [A] circuit breaker mechanism should be put in place that operates in a coordinated fashion across all markets, using pre-established limits broad enough to be tripped only on rare occasions, but which are sufficient to support the ability of payment and credit systems to keep pace with extraordinarily large market declines."[8]

Coordination across markets is important because of the interrelationship between the stock market, stock index futures market, and stock index options markets. The infrequency of temporarily suspending trading was emphasized by several studies following Black Monday. These studies note that too frequent halting of trading other than those in the case of extreme movements impedes price discovery and does not allow the efficient implementation of portfolio strategies by investors.

On April 15, 1998, the NYSE, following approval by the SEC, implemented new regulations to increase and widen thresholds at which trading is halted for single-day declines. The stock market indicator that was selected to measure the decline in the market was the DJIA. The point levels are set quarterly at 10% (Level One circuit breaker), 20% (Level Two circuit breaker), and 30% (Level Three circuit breaker) of the DJIA by using the DJIA average closing value of the previous month, rounded to the nearest 50 points. Point levels are adjusted on January 1, April 1, July 1, and October 1. The formulas for these thresholds are set forth in the NYSE Rule 80B.

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[7] The strategy was called "portfolio insurance" or dynamic asset allocation.

[8] U.S. Senate hearing before the Committee on Banking, Housing, and Urban Affairs on May 24, 1988: "The Conclusions and Recommendations of the President's 'Working Group on Financial Markets.'"

For example, consider the circuit breakers established on April 1, 2007. The average value for the DJIA for March 2007 rounded to the nearest 50 points was used to calculate the three point levels. This resulted in the Level One (10%) circuit breaker set at 1,250 points, Level Two (20%) circuit breaker set at 2,450 points, and the Level Three (30%) circuit breaker set at 3,700 points. Each level then results in a different halting of activity. For example:

Level One: A 1,250-point drop in the DJIA halts trading for one hour if the decline occurs before 14:00; for 30 minutes if before 14:30; and has no effect between 14:30 and 16:00.
Level Two: A 2,450-point drop halts trading for two hours if the decline occurs before 13:00; for one hour if before 14:00; and for the rest of the day if after 14:00.
Level Three: A 3,700-point drop halts trading for the remainder of the day regardless of when the decline occurs.

Trading Collar Rule

Another type of trading restriction applies to index arbitrage trading whereby, for example, a basket of S&P 500 stocks is bought (sold) against the sale (purchase) of an S&P 500 futures contract. On February 16, 1999, following approval by the SEC, the NYSE implemented revisions to Rule 80A (the **trading collar rule**), which restricts index arbitrage trading. Under the revised rule, if the DJIA moves up or down 2% from the previous closing value, program trading orders to buy or sell the S&P 500 stocks as part of index arbitrage strategies must be entered with directions to have the order executions affected in a manner that stabilizes share prices. The collar restrictions are removed if the DJIA returns to or within 1% of its previous closing value. The trading collar rule's threshold of 2% is calculated at the beginning of each quarter. For example, on April 1, 2007, the average value for the DJIA for March 2007 was used to calculate a 2% collar trading rule threshold of 180 points.

STOCK MARKET INDICATORS

Stock market indicators have come to perform a variety of functions, from serving as benchmarks for evaluating the performance of professional money managers to answering the question "How did the market do today?" Thus, stock **market indicators** (**indexes** or averages) have become a part of everyday life. Even though many of the stock market indicators are used interchangeably, it is important to realize that each indicator applies to, and measures, a different facet of the stock market.

The most commonly quoted stock market indicator is the Dow Jones Industrial Average (DJIA). Other stock market indicators cited in the financial press are the Standard & Poor's 500 Composite (S&P 500), the New York Stock Exchange Composite Index (NYSE Composite), and the Nasdaq Composite Index. A myriad of other stock market indicators, such as the Wilshire, Russell, and Morgan Stanley stock indexes, are followed primarily by institutional money managers. Table 2 provides a list of the various stock indexes traded in the United States.

In general, stock market indexes rise and fall in fairly similar patterns. The indexes do not move in exactly the same ways at all times. The differences in movement reflect the different ways in which the indexes are constructed. Three factors enter into that construction: the universe of stocks represented by the sample underlying the index, the relative

Exchange Provided Indexes

NEW YORK STOCK EXCHANGE

NYSE Composite Index

NYSE U.S. 100 Index

NYSE World Leaders Index

NYSE TMT Index

THE AMERICAN STOCK EXCHANGE

Amex Composite

Amex 20 Stock Index

Amex Airline Index

Amex Basic Industries Sector Index

Amex Biotech Index

Amex Broker/Dealer Index

Amex Composite Index

Amex Computer Technology Index

Amex Consumer Service Sector Index

Amex Consumer Staples Sector Index

Amex CSFB Technology Index

Amex Cyclical/Transport Sector Index

Amex Defense Index

Amex Disk Drive Index

Amex Drug Index

Amex Electric Power & Natural Gas

Amex Energy Sector Index

Amex Financial Sector Index

Amex Gold Bugs

Amex Industrial Sector Index

Amex IT 20 Index

Amex MS Consumer Index

Amex MS Cyclical Index

Amex MS Healthcare Payer Index

Amex MS Healthcare Products Index

Amex MS Healthcare Providers Index

Amex MS Hi Tech 35 Index

Amex MS REIT Index

Amex Natural Gas Index

Amex Networking Index

Amex Oil & Gas Index

Amex Stockcar Stocks

Amex Technology Sector Index

(Continued)

Table 2 Stock Index

Amex Telecomm Index
Amex Utility Sector Index
Institutional Index

NASDAQ

NASDAQ Composite Index
NASDAQ National Market Composite Index
NASDAQ-100 Index
NASDAQ-100 Equal Weighted Index
NASDAQ-100 Technology Sector Index
NASDAQ-100 Ex-Tech Sector Index
NASDAQ Financial-100 Index
NASDAQ Biotechnology Index
NASDAQ Biotechnology Equal Weighted Index
NASDAQ Bank Index
NASDAQ Computer Index
NASDAQ Health Care Index
NASDAQ Industrial Index
NASDAQ National Market Industrial Index
NASDAQ Insurance Index
NASDAQ Other Finance Index
NASDAQ Telecommunications Index
NASDAQ Transportation Index
Non-Exchange Indexes

DOW JONES & CO.

Dow Jones Average—30 Industrial
Dow Jones Average—20 Transportation
Dow Jones Average—15 Utilities

DOW JONES & CO./WILSHIRE ASSOCIATES

Dow Jones Wilshire 5000 Total Market Index
The Dow Jones Wilshire 4500 Completion Index
Dow Jones Wilshire U.S. Large-Cap Index
Dow Jones Wilshire U.S. Mid-Cap Index
Dow Jones Wilshire U.S. Small-Cap Index
Dow Jones Wilshire U.S. Micro-Cap Index
Dow Jones Wilshire U.S. Large-Cap Value Index
Dow Jones Wilshire U.S. Large-Cap Growth Index
Dow Jones Wilshire U.S. Mid-Cap Value Index
Dow Jones Wilshire U.S. Mid-Cap Growth Index
Dow Jones Wilshire U.S. Small-Cap Value Index

(Continued)

Dow Jones Wilshire U.S. Small-Cap Growth Index
Dow Jones Wilshire U.S. 2500 Index
The Wilshire Large Cap 750 Index
The Wilshire Mid-Cap 300 Index
The Wilshire Small Cap 1750 Index
The Wilshire Micro-Cap Index
The Wilshire Large Value Index
The Wilshire Large Growth Index
The Wilshire Mid-Cap Value Index
The Wilshire Mid-Cap Growth Index
The Wilshire Small Value Index
The Wilshire Small Growth Index
The Wilshire All Value Index
The Wilshire All Growth Index
The Wilshire Small Cap 250

STANDARD & POOR'S

S&P Composite 1500 Index
S&P 100 Index
S&P 500 Index
S&P Midcap 400 Index
S&P Smallcap 600 Index

FRANK RUSSELL

Russell—3000 Index
Russell—2000 Index
Russell—1000 Index
Russell 2000 Growth
Russell 2000 Value
Russell 1000 Growth
Russell 1000 Value
Frank Russell—Midcap Index

MSCI BARRA

MSCI US Broad Market Index
MSCI US Prime Market 750 Index
MSCI US Prime Market Value Index
MSCI US Prime Market Growth Index
MSCI US Mid Cap 450 Index
MSCI US Small Cap 1750 Index
MSCI US Small Cap Value Index
MSCI US Small Cap Growth Index
MSCI US Investable Market Consumer Discretionary Index

(Continued)

	MSCI US Investable Market Consumer Staples Index
	MSCI US Investable Market Energy Index
	MSCI US Investable Market Financials Index
	MSCI US Investable Market Health Care Index
	MSCI US Investable Market Industrials Index
	MSCI US Investable Market Information Technology Index
	MSCI US Investable Market Materials Index
	MSCI US Investable Market Telecommunications Index
	MSCI US Investable Market Utilities Index

Source: *Compiled by the authors. The indexes listed in this table do not include indexes on non–U.S. stock markets nor non–U.S. companies.*

weights assigned to the stocks included in the index, and the method of averaging across all the stocks in the index.

Stock market indicators can be classified into three groups:

- those produced by stock exchanges based on all stocks traded on the exchanges
- those produced by organizations that subjectively select the stocks to be included in indexes
- those where stock selection is based on an objective measure, such as the market capitalization of the company

The first group includes the New York Stock Exchange Composite Index, which reflects the market value of all stocks traded on the exchange. The two most popular stock market indicators in the second group are the Dow Jones Industrial Average and the Standard & Poor's 500. The DJIA is constructed from 30 of the largest blue-chip industrial companies. The companies included in the average are those selected by Dow Jones & Company, publisher of the *Wall Street Journal*. The S&P 500 represents stocks chosen from the two major national stock exchanges and the over-the-counter market. The stocks in the index at any given time are determined by a committee of Standard & Poor's Corporation, which may occasionally add or delete individual stocks or the stocks of entire industry groups. The aim of the committee is to capture present overall stock market conditions as reflected in a very broad range of economic indicators.

Some indexes represent a broad segment of the stock market while others focus on a particular sector such as technology, oil and gas, and financial. In addition, because the notion of an equity investment style is widely accepted in the investment community, early acceptance of equity style investing in the form of growth versus value and small market capitalization versus large capitalization has led to the creation and proliferation of published *style and market cap indexes*. These indexes are shown in Table 2.

In the third group, we have the Wilshire indexes produced by Wilshire Associates (Santa Monica, California) and Russell indexes produced by the Frank Russell Company (Tacoma, Washington), a consultant to pension funds and other institutional investors. The criterion for inclusion in each of these indexes is solely a firm's market capitalization. The most comprehensive index is the Wilshire 5000, which currently includes more than 6,700 stocks, up

from 5,000 at its inception. The Wilshire 4500 includes all stocks in the Wilshire 5000 except for those in the S&P 500. Thus, the shares in the Wilshire 4500 have smaller capitalization than those in the Wilshire 5000. The Russell 3000 encompasses the 3,000 largest companies in terms of their market capitalization. The Russell 1000 is limited to the largest 1,000 of those, and the Russell 2000 has the remaining smaller firms.

The stocks included in a stock market index must be combined in certain proportions, and each stock must be given a weight. The three main approaches to weighting are (1) weighting by the market capitalization of the stock's company, which is the value of the number of shares times the price per share; (2) weighting by the price of the stock; and (3) equal weighting for each stock, regardless of its price or its firm's market value. With the exception of the Dow Jones averages (such as the DJIA), all of the most widely used indexes are market-value weighted. The DJIA is a price-weighted average.

Key Points That You Should Understand Before Proceeding

1. What a market index is and what it is supposed to convey.
2. The key differences among the important stock market indexes in terms of the universe each index represents, the sample of stocks on which it is based, the method of weighting, the method of averaging, and the entity responsible for producing and publishing the index.

PRICING EFFICIENCY OF THE STOCK MARKET

A price-efficient market is one in which security prices at all times fully reflect all available information that is relevant to their valuation. When a market is price efficient, investment strategies pursued to outperform a broad-based stock market index will not consistently produce superior returns after adjusting for risk and transaction costs.

Numerous studies have examined the pricing efficiency of the stock market. While it is not our intent in this chapter to provide a comprehensive review of these studies, we can summarize their basic findings and their implications for investment strategies.

Forms of Efficiency

The three different forms of pricing efficiency are

- weak form
- semistrong form
- strong form

The distinctions among these forms lie in the relevant information that is believed to be taken into consideration in the price of the security at all times. *Weak-form efficiency* means that the price of the security reflects the past price and trading history of the security. *Semistrong-form efficiency* means that the price of the security fully reflects all public information (which, of course, includes, but is not limited to, historical price and trading patterns). *Strong-form efficiency* exists in a market where the price of a security reflects all information, whether it is publicly available or known only to insiders such as the firm's managers or directors.

The preponderance of empirical evidence supports the claim that the common stock market is efficient in the weak form. The evidence emerges from statistical tests that explore whether or not historical price movements can be used to project future prices in such a way as to produce returns above what one would expect from market movements and the risk class of the security. Such returns are known as **abnormal returns** and since they are positive they are referred "positive" abnormal returns. The implications are that investors who follow a strategy of selecting stocks solely on the basis of price patterns or trading volume—such investors are referred to as technical analysts or **chartists**—should not expect to do better than the market. In fact, they may fare worse because of higher transactions costs associated with frequent buying and selling of stocks.

Evidence on whether or not the stock market is price efficient in the semistrong form is mixed. Some studies support the proposition of efficiency when they suggest that investors who select stocks on the basis of fundamental security analysis—which consists of analyzing financial statements, the quality of management, and the economic environment of a company—will not outperform the market. This result is certainly reasonable: There are so many analysts using the same approach, with the same publicly available data, that the price of the stock remains in line with all the relevant factors that determine value. On the other hand, a sizable number of other studies have produced evidence indicating that there have been instances and patterns of pricing inefficiency in the stock market over long periods of time. Economists and financial analysts often label these examples of inefficient pricing as **anomalies in the market**, that is, phenomena that cannot be easily explained.

Empirical tests of strong-form pricing efficiency fall into two groups: (1) studies of the performance of professional money managers, and (2) studies of the activities of insiders (individuals who are either company directors, major officers, or major stockholders). Studying the performance of professional money managers to test the strong form of pricing efficiency has been based on the belief that professional managers have access to better information than the general public. Whether or not this is true is moot because the empirical evidence suggests professional managers have not been able to outperform the market consistently. In contrast, evidence based on the activities of insiders has generally revealed that this group often achieves higher returns than the stock market. Of course, insiders could not get those high abnormal returns if the stock prices fully reflected all relevant information about the values of the firms. Thus, the empirical evidence on insider trading argues against the notion that the market is efficient in the strong-form sense.

Implications for Investing in Common Stock

Common stock investment strategies can be classified into two general categories: active strategies and passive strategies. *Active strategies* are those that attempt to outperform the market by one or more of the following: timing the selection of transactions, such as in the case of technical analysis, identifying undervalued or overvalued stocks using **fundamental security analysis**, or selecting stocks according to one of the market anomalies. Obviously, the decision to pursue an active strategy must be based on the belief that there is some type of gain from such costly efforts, but gains are possible only if pricing inefficiencies exist. The particular strategy chosen depends on why the investor believes this is the case.

Investors who believe that the market prices stocks efficiently should accept the implication that any attempts to outperform the market cannot be systematically successful, except by luck. This implication does not mean that investors should shun the stock

market, but rather that they should pursue a *passive strategy*, which is one that does not attempt to outperform the market. Is there an optimal investment strategy for someone who holds this belief in the pricing efficiency of the stock market? Indeed there is. Its theoretical basis is the modern portfolio theory and capital market theory. According to modern portfolio theory, the market portfolio offers the highest level of return per unit of risk in a market that is price efficient. A portfolio of financial assets with characteristics similar to those of a portfolio consisting of the entire market—the market portfolio—will capture the pricing efficiency of the market.

How can such a passive strategy be implemented? More specifically, what is meant by a market portfolio, and how should that portfolio be constructed? In theory, the market portfolio consists of all financial assets, not just common stock. The reason is that investors compare all investment opportunities, not just stock, when committing their capital. Thus, our principles of investing must be based on capital market theory, not just stock market theory. When the theory is applied to the stock market, the market portfolio has been defined as consisting of a large universe of common stocks. But how much of each common stock should be purchased when constructing the market portfolio? Theory states that the chosen portfolio should be an appropriate fraction of the market portfolio; hence, the weighting of each stock in the market portfolio should be based on its relative market capitalization. Thus, if the aggregate market capitalization of all stocks included in the market portfolio is $T and the market capitalization of one of these stocks is $A, then the fraction of this stock that should be held in the market portfolio is $A/$T.

The passive strategy that we have just described is called indexing. As pension fund sponsors have increasingly come to believe that money managers are unable to outperform the stock market, the amount of funds managed using an indexing strategy has grown substantially. Index funds, however, still account for a relatively small fraction of institutional stock investments.

Fundamental Indexing

Traditionally, as indicated, most indexes and, thus, index funds have been capitalization weighted. But beginning in 2004, the case began to be made for an alternative weighting methodology. The skeptics of capitalization weighting observed that during the technology bubble of the late 1990s, as the large capitalization growth stocks became what many observers believed was overvalued (based on recent returns, price-to-earnings ratios, and other metrics). Because of their rising prices, their market capitalization increased and, thus, their weights in a market capitalization-weighted index increased. Thus, a market capitalization-weighted index such as the S&P 500 index realized a progressively larger weighting to what were regarded as progressively overpriced stocks.

Some market participants argue that it would be preferable to use a weighting variable that does not reflect market capitalization. Fundamental variables such as dividends, earnings, or sales that reflect size have been suggested.

Consider some comments on this issue. Clearly, market capitalization-weighted indexes have a growth tilt and fundamental indexes have a value tilt. This difference introduces a discussion of the difference between an index and a strategy. Second, market capitalization-weighted indexes provide market clearing portfolios and require no rebalancing as stock prices change. Fundamentally weighted portfolios do not necessarily clear the market and require rebalancing as stock price change. Rebalancing also incurs costs.

The controversy between market capitalization weighting and funds market weighting continues. In practice, capitalization weighting continues to be the dominant practice, but fundamentally weighted mutual funds and ETFs have been introduced.

Overall, investors do not need to have a view on this debate to decide which type of weighting to employ, but simply a view on how they want their portfolios to behave.[9]

Key Points That You Should Understand Before Proceeding

1. The relevant information that is believed to be discounted in the price of a stock at all times for the three forms of pricing efficiency (weak form, semistrong form, and strong form).
2. The implications of the weak form of pricing efficiency for chartists or technical analysts.
3. The implications of the semistrong form of pricing efficiency for fundamental security analysts.
4. The general conclusion about pricing efficiency that empirical research into U.S. markets tends to support.
5. Why the price efficiency of a market influences the decision as to whether an investor will pursue an active strategy or passive strategy.

SUMMARY

Common stock represents an ownership interest in a corporation. The secondary market for common stock has undergone significant changes since the 1960s. The major participants are now institutional investors rather than retail investors, although the availability of discount brokers with their low commissions have induced some retail investors to become more active traders. Advances in computer technology have ushered in developments for linking the various market locations and systems for institution-to-institution direct trading.

Different types of orders may be submitted to the stock markets. The most common type is a market order, which means that the order must be filled immediately at the best price. Other types of orders, such as stop and limit orders, are filled only if the market price reaches a price specified in the order.

In buying and selling stock in the secondary market, the brokerage commission is the most obvious type of trading cost and object of competition among broker-dealers for both institutional and retail investors. However, other types of trading costs, such as impact costs and opportunity costs, may be larger than commissions. To accommodate the trading needs of institutional investors who tend to place orders of larger sizes and with a large number of names, special arrangements have evolved. Block trades are trades of 10,000 shares or more of a given stock or trades with a market value of $200,000 or more. Program

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[9] For different views on fundamental indexing, see the following: Clifford Asness, "The Value of Fundamental Indexing," *Institutional Investor* (October 2006), pp. 95–99 and Robert Arnott, "An Overwrought Orthodoxy," *Institutional Investor* (December 2006), pp. 36–41.

trades, or basket trades, involve the buying and/or selling of a large number of names simultaneously. The institutional arrangement that has evolved to accommodate these needs is the upstairs market, which is a network of trading desks of the major securities firms and institutional investors that communicate with each other by means of electronic display systems and telephones.

Stock market indicators can be classified into three groups: (1) those produced by stock exchanges and that include all stocks to be traded on the exchange (such as the NYSE Composite Index), (2) those in which a committee subjectively selects the stocks to be included in the index (such as the S&P 500 Index), and (3) those in which the stocks selected are based solely on stocks' market capitalizations (such as the Wishire and Russell indexes).

There are three forms of pricing efficiency according to what is hypothesized to be the relevant information that is believed to be embodied in the price of a stock at all times: (1) weak form, (2) semistrong form, and (3) strong form. Most of the empirical evidence appears to suggest that markets are efficient in the weak form. The evidence on the semi-strong form is mixed, as pockets of inefficiency have been observed. Empirical tests of strong-form pricing efficiency have also produced conflicting results.

Active investment strategies, consisting of efforts to time purchases and select stocks, are pursued by investors who believe that securities are mispriced enough that it is possible to capitalize on strategies that are designed to exploit the perceived inefficiency. The optimal strategy to pursue when the stock market is perceived to be price efficient is indexing because it allows the investor to capture the efficiency of the market.

KEY TERMS

- Abnormal returns
- Anomalies in the market
- Block trade
- Broker call rate
- Buying on margin
- Call money rate
- Chartist
- Circuit breaker
- Dividends
- Fill or kill order
- Forms of pricing efficiency
- Frontrun
- Fundamental security analysis
- impact cost
- Initial margin requirement
- Limit order book
- Maintenance margin requirement
- Market capitalization
- Market if touched order
- Market indicator (index)
- Market order
- Odd lot
- Open order
- Preferred stock
- Program (basket) trade
- Qualified dividends
- Round lot
- Soft dollars
- Stop order
- Tick size
- Timing cost
- Trading collar rule
- Trading costs
- Transaction costs
- Upstairs marke

QUESTIONS

1. What are the three factors contributing to the significant changes in the common market over the past 50 years?
2. **a.** How does common stock differ from preferred stock?
   b. Why is preferred stock viewed as a senior corporate security?
3. What is the difference between ordinary dividends and qualified dividends and how is each treated for tax purposes?
4. What is meant by a long-term capital gain and how is it treated for tax purposes?
5. The following quote is taken from Wayne H. Wagner, "The Taxonomy of Trading Strategies," in Katrina F. Sherrerd (ed.), *Trading Strategies and Execution Costs* (Charlottesville, VA: The Institute of Chartered Financial Analysts, 1988).

   > When a trader decides how to bring an order to the market, he or she must deal with some very important issues; to me, the most important is: What kind of trade is this? It could be either an active or a passive trade. The type of trade will dictate whether speed of execution is more or less important than cost of execution. In other words, do I want immediate trading (a market order); or am I willing to forgo the immediate trade for the possibility of trading less expensively if I am willing to "give" on the timing of the trade (a limit order)?

   a. What is meant by a market order?
   b. Why would a market order be placed when an investor wants immediate trading?
   c. What is meant by a limit order?
   d. What are the risks associated with a limit order?
6. Suppose that Mr. Mancuso has purchased a stock for $45 and that he sets a maximum loss that he will accept on this stock of $6. What type of order can Mr. Mancuso place?
7. **a.** What is a program trade?
   b. What are the various types of commission arrangements for executing a program trade and the advantages and disadvantages of each?
8. **a.** Explain the mechanics and some key rules of a short sale.
   b. What restrictions are imposed on short selling activities?
9. What role does the broker call rate play in a margin purchase?
10. **a.** What is meant by maintenance margin when stocks are purchased on margin?
    b. What is meant by debit balance?
    c. What is meant by credit balance?
11. The following statements are taken from Greta E. Marshall's article "Execution Costs: The Plan Sponsor's View," which appears in *Trading Strategies and Execution Costs*, published by The Institute of Chartered Financial Analysts in 1988. (The publication is the product of a conferer ce held in New York City on December 3, 1987):
    a. "There are three components of trading costs. First there are direct costs which may be measured—commissions. Second, there are indirect—or market impact—costs. Finally, there are the undefined costs of not trading." What are market impact costs, and what do you think the "undefined costs of not trading" represent?
    b. "Market impact, unlike broker commissions, is difficult to identify and measure." Why is market impact cost difficult to measure?
12. **a.** What is meant by "soft dollars"?
    b. What is the concern with soft dollars?
13. **a.** What is meant by tick size?
    b. What is the tick size for common stock?
14. Why were price limits and collars imposed on stock in the United States?
15. **a.** What is meant by the circuit breaker rule?
    b. What is meant by the trading collar rule?
16. What are the three general types of stock market indicators?
17. What is the difference between a market-value-weighted index and an equally weighted index?
18. What are the main features of the S&P 500 common stock index?
19. "The stocks selected for the S&P 500 are the largest 500 companies in the United States." Indicate whether you agree or disagree with this statement.

20. There are participants and analysts in the stock market that are called chartists or technical analysts. What does the theory that the market is weak-form efficient say about these investors' chances of beating the market?
21. The November 1985 prospectus of the Merrill Lynch Phoenix Fund, Inc., a mutual fund, stated the following investment objective:

> Based upon the belief that the pricing mechanism of the securities markets lacks perfect efficiency so that prices of securities of troubled issuers are often depressed to a greater extent than warranted by the condition of the issuer and that, while investment in such securities involves a high degree of risk, such investments offer the opportunity for significant capital gains.

What does this strategy assume about the pricing efficiency of the stock market?

22. Why should an investor who believes that the market is efficient pursue an indexing strategy?