

The Handbook of
**financial
instruments**

FRANK J. FABOZZI

EDITOR



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**financial
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contents

Preface	ix
Contributing Authors	xiii
CHAPTER 1	
Overview of Financial Instruments	1
Frank J. Fabozzi	
CHAPTER 2	
Fundamentals of Investing	15
Frank J. Fabozzi	
CHAPTER 3	
Calculating Investment Returns	35
Bruce Feibel	
CHAPTER 4	
Common Stock	67
Frank J. Fabozzi, Frank J. Jones, and Robert R. Johnson	
CHAPTER 5	
Sources of Information for Investing in Common Stock	119
Pamela P. Peterson and Frank J. Fabozzi	
CHAPTER 6	
Money Market Instruments	143
Frank J. Fabozzi, Steven V. Mann, and Moorad Choudhry	
CHAPTER 7	
U.S. Treasury Securities	185
Frank J. Fabozzi and Michael J. Fleming	

CHAPTER 8	
Inflation-Indexed Bonds	203
John B. Brynjolfsson	
CHAPTER 9	
Federal Agency Securities	215
Frank J. Fabozzi and George P. Kegler	
CHAPTER 10	
Municipal Securities	229
Frank J. Fabozzi	
CHAPTER 11	
Corporate Bonds	251
Frank J. Fabozzi	
CHAPTER 12	
Preferred Stock	283
Steven V. Mann and Frank J. Fabozzi	
CHAPTER 13	
Emerging Markets Debt	297
Maria Mednikov Loucks, John A. Penicook, Jr., and Uwe Schillhorn	
CHAPTER 14	
Agency Mortgage-Backed Securities	331
Frank J. Fabozzi and David Yuen	
CHAPTER 15	
Nonagency MBS and Real Estate-Backed ABS	367
Frank J. Fabozzi and John Dunlevy	
CHAPTER 16	
Commercial Mortgage-Backed Securities	399
Joseph F. DeMichele, William J. Adams, and Duane C. Hewlett	
CHAPTER 17	
Non-Real Estate Asset-Backed Securities	423
Frank J. Fabozzi and Thomas A. Zimmerman	

CHAPTER 18	
Credit Card ABS	449
John N. McElravey	
CHAPTER 19	
Leveraged Loans	469
Steven Miller	
CHAPTER 20	
Collateralized Debt Obligations	483
Laurie S. Goodman and Frank J. Fabozzi	
CHAPTER 21	
Investment Companies	503
Frank J. Jones and Frank J. Fabozzi	
CHAPTER 22	
Exchange-Traded Funds and Their Competitors	531
Gary L. Gastineau	
CHAPTER 23	
Stable-Value Pension Investments	555
John R. Caswell and Karl P. Tourville	
CHAPTER 24	
Investment-Oriented Life Insurance	573
Frank J. Jones	
CHAPTER 25	
Hedge Funds	605
Mark J. P. Anson	
CHAPTER 26	
Private Equity	671
Mark J. P. Anson	
CHAPTER 27	
Real Estate Investment	697
Susan Hudson-Wilson	

CHAPTER 28	
Equity Derivatives	723
Bruce M. Collins and Frank J. Fabozzi	
CHAPTER 29	
Interest Rate Derivatives	755
Frank J. Fabozzi and Steven V. Mann	
CHAPTER 30	
Mortgage Swaps	775
David Yuen and Frank J. Fabozzi	
CHAPTER 31	
Credit Derivatives	785
Moorad Choudhry	
CHAPTER 32	
Managed Futures	805
Mark J. P. Anson	
INDEX	825

One of the most important investment decisions that an investor encounters is the allocation of funds among the wide range of financial instruments. That decision requires an understanding of the investment characteristics of all asset classes. The objective of *The Handbook of Financial Instruments* is to explain financial instruments and their characteristics.

In Chapter 1, financial assets and financial markets are defined. Also explained in the chapter are the general characteristics of common stock and fixed-income securities, the properties of financial markets, the general principles of valuation, the principles of leverage, mechanisms for borrowing funds in the market using securities as collateral, and the role of derivative products.

Chapter 2 provides the fundamentals of investing. This is done in terms of the phases of the investment management process. The topics included in the chapter are traditional and alternative asset classes, how asset classes are determined, various types of risk, active versus passive portfolio management, and active versus indexed portfolio construction.

Chapter 3 explains the proper methodology for computing investment returns. Complications associated with calculating investment returns include selection of the appropriate inputs in the calculation, treatment of client contributions and withdrawals from an investment account, the timing of contributions and withdrawals, the difference between return earned by the investment manager on the funds invested and the return earned by the client, and how to determine annual returns from subperiod returns (e.g., different methods for averaging).

Equity, more popularly referred to as common stock, is the subject of Chapters 4 and 5. Chapter 4 describes the markets where common stock is traded, the types of trades that can be executed by retail and institutional investors (e.g., block trades and program trades), transaction costs, stock market indicators, the pricing efficiency of the equity market, common stock portfolio management, active portfolio management (e.g., top-down versus bottom-up approaches, fundamental versus technical analysis, popular active stock market strategies, and equity style management).

Where an investor can obtain information about the issuers of common stock and the type of information available is the subject of Chapter 5.

Chapters 6 through 20 cover fixed income products—money market instruments, Treasury securities (fixed principal and inflation indexed securities), federal agency securities, municipal securities, corporate bonds, preferred stock, emerging market debt, leveraged loans, and structured products. Structured products covered include agency mortgage-backed securities, nonagency mortgage-backed securities, real estate-backed asset-backed securities (e.g., home equity loan-backed securities and manufactured home loan-backed securities), commercial mortgage-backed securities, non-real estate-backed securities (e.g., credit card receivable-backed securities, auto loan-backed securities, Small Business Administration loan-backed securities, student loan-backed securities, aircraft lease-backed securities, and rate reduction bonds), and collateralized debt obligations.

Chapter 21 provides comprehensive coverage of investment companies, more popularly referred to as mutual funds. Topics covered are the types of investment companies, fund sales charges and annual operating expenses, multiple share classes, types of funds by investment objective, regulation of funds, the advantages and disadvantages of mutual funds, and alternatives to mutual funds. One alternative to a mutual fund is an exchange-traded fund. The advantages of an exchange-traded fund are explained Chapter 22, which also covers competitor products.

Stable value products are covered in Chapter 23. These products provide for a guaranteed return of principal at a contractually specified rate, the guarantee being only as good as the issuer of the contract. Examples include fixed annuities and traditional guaranteed investment contracts (GICs), separate account GICs, and bank investment contracts. Comprehensive coverage of investment-oriented life insurance products is provided in Chapter 24. These products include cash value life insurance (variable life, universal life, and variable universal life) and annuities (variable, fixed, and GICs). General account versus separate account products and the taxability of life insurance products are also discussed in the chapter.

Two major alternative asset classes are hedge funds and private equity. They are the subject of Chapters 25 and 26, respectively. The coverage of hedge funds includes regulation, strategies employed by hedge funds (e.g., long/short hedge funds, global macro hedge fund, short selling hedge funds, arbitrage hedge funds, and market neutral hedge funds), evidence on performance persistence, selecting a hedge fund manager, and the various aspects of due diligence. Private equity includes four strategies for private investing—venture capital (i.e., financing of start-up companies), leverage buyouts, mezzanine financing (hybrid of private debt and private equity), and distressed debt investing. Each of these strategies is reviewed in Chapter 26.

Real estate investment is covered in Chapter 27. The topics covered include the distinguishing features of real estate investments, the nature of the investors, components of the real estate investment universe (private equity, private debt, commercial mortgage-backed securities, and public equity) and their risk/return characteristics, the primary reasons to consider real estate in an investment portfolio, and how to bring real estate into a portfolio (i.e., execution).

Derivative instruments are covered in Chapters 28–31—futures/forward contracts, options, futures options, swaps, caps, and floors. The focus is on how these instruments can be employed to control risk. Chapter 28 covers equity derivatives and describes the fundamentals of pricing stock index futures and options on individual stocks. Chapter 29 is devoted to interest rate derivatives and how they are employed to control interest rate risk. Because of the unique investment characteristics of mortgage-backed securities, instruments are available that can be used by institutional investors to control the interest rate and prepayment risks associated with these securities and to obtain exposure to the market on a leveraged basis. These products, mortgage swaps, are described in Chapter 30. In addition to controlling interest rate risk, investors are concerned with credit risk. Instruments for controlling this risk, credit derivatives, are explained in Chapter 31.

Managed futures, an alternative asset class, is the subject of Chapter 32. The term managed futures refers to the active trading of futures and forward contracts. The underlying for the futures/forward contracts traded can be financial instruments (stock indexes or bonds), commodities, or currencies (i.e., foreign exchange).

The Handbook of Financial Instruments provides the most comprehensive coverage of financial instruments that has ever been assembled in a single volume. I thank all of the contributors to this book for their willingness to take the time from their busy schedules to contribute.

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Overview of Financial Instruments

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Broadly speaking, an asset is any possession that has value in an exchange. Assets can be classified as tangible or intangible. A tangible asset is one whose value depends on particular physical properties—examples are buildings, land, or machinery. Intangible assets, by contrast, represent legal claims to some future benefit. Their value bears no relation to the form, physical or otherwise, in which these claims are recorded. Financial assets are intangible assets. For financial assets, the typical benefit or value is a claim to future cash. This book deals with the various types of *financial assets* or *financial instruments*.

The entity that has agreed to make future cash payments is called the *issuer* of the financial instrument; the owner of the financial instrument is referred to as the *investor*. Here are seven examples of financial instruments:

- A loan by Fleet Bank (investor/commercial bank) to an individual (issuer/borrower) to purchase a car
- A bond issued by the U.S. Department of the Treasury
- A bond issued by Ford Motor Company
- A bond issued by the city of Philadelphia
- A bond issued by the government of France

- A share of common stock issued by Microsoft Corporation, an American company
- A share of common stock issued by Toyota Motor Corporation, a Japanese company

In the case of the car loan by Fleet Bank, the terms of the loan establish that the borrower must make specified payments to the commercial bank over time. The payments include repayment of the amount borrowed plus interest. The cash flow for this asset is made up of the specified payments that the borrower must make.

In the case of a U.S. Treasury bond, the U.S. government (the issuer) agrees to pay the holder or the investor the interest payments every six months until the bond matures, then at the maturity date repay the amount borrowed. The same is true for the bonds issued by Ford Motor Company, the city of Philadelphia, and the government of France. In the case of Ford Motor Company, the issuer is a corporation, not a government entity. In the case of the city of Philadelphia, the issuer is a municipal government. The issuer of the French government bond is a central government entity.

The common stock of Microsoft entitles the investor to receive dividends distributed by the company. The investor in this case also has a claim to a pro rata share of the net asset value of the company in case of liquidation of the company. The same is true of the common stock of Toyota Motor Corporation.

DEBT VERSUS EQUITY INSTRUMENTS

Financial instruments can be classified by the type of claim that the holder has on the issuer. When the claim is for a fixed dollar amount, the financial instrument is said to be a *debt instrument*. The car loan, the U.S. Treasury bond, the Ford Motor Company bond, the city of Philadelphia bond, and the French government bond are examples of debt instruments requiring fixed payments.

In contrast to a debt obligation, an *equity instrument* obligates the issuer of the financial instrument to pay the holder an amount based on earnings, if any, after the holders of debt instruments have been paid. Common stock is an example of an equity claim. A partnership share in a business is another example.

Some securities fall into both categories in terms of their attributes. Preferred stock, for example, is an equity instrument that entitles the investor to receive a fixed amount. This payment is contingent, however, and due only after payments to debt instrument holders are made.

Another “combination” instrument is a convertible bond, which allows the investor to convert debt into equity under certain circumstances. Both debt instruments and preferred stock that pay fixed dollar amounts are called *fixed-income instruments*.

CHARACTERISTICS OF DEBT INSTRUMENTS

As will become apparent, there are a good number of debt instruments available to investors. Debt instruments include loans, money market instruments, bonds, mortgage-backed securities, and asset-backed securities. In the chapters that follow, each will be described. There are features of debt instruments that are common to all debt instruments and they are described below. In later chapters, there will be a further discussion of these features as they pertain to debt instruments of particular issuers.

Maturity

The term to maturity of a debt obligation is the number of years over which the issuer has promised to meet the conditions of the obligation. At the maturity date, the issuer will pay off any amount of the debt obligation outstanding. The convention is to refer to the “term to maturity” as simply its “maturity” or “term.” As we explain later, there may be provisions that allow either the issuer or holder of the debt instrument to alter the term to maturity.

The market for debt instruments is classified in terms of the time remaining to its maturity. A *money market instrument* is a debt instrument which has one year or less remaining to maturity. Debt instruments with a maturity greater than one year are referred to as a *capital market debt instrument*.

Par Value

The *par value* of a bond is the amount that the issuer agrees to repay the holder of the debt instrument by the maturity date. This amount is also referred to as the *principal*, *face value*, *redemption value*, or *maturity value*. Bonds can have any par value.

Because debt instruments can have a different par value, the practice is to quote the price of a debt instrument as a percentage of its par value. A value of 100 means 100% of par value. So, for example, if a debt instrument has a par value of \$1,000 and is selling for \$900, it would be said to be selling at 90. If a debt instrument with a par value of \$5,000 is selling for \$5,500, it is said to be selling for 110. The reason why a debt instrument sells above or below its par value is explained in Chapter 2.

Coupon Rate

The *coupon rate*, also called the *nominal rate* or the *contract rate*, is the interest rate that the issuer/borrower agrees to pay each year. The dollar amount of the payment, referred to as the *coupon interest payment* or simply *interest payment*, is determined by multiplying the coupon rate by the par value of the debt instrument. For example, the interest payment for a debt instrument with a 7% coupon rate and a par value of \$1,000 is \$70 (7% times \$1,000).

The frequency of interest payments varies by the type of debt instrument. In the United States, the usual practice for bonds is for the issuer to pay the coupon in two semiannual installments. Mortgage-backed securities and asset-backed securities typically pay interest monthly. For bonds issued in some markets outside the United States, coupon payments are made only once per year. Loan interest payments can be customized in any manner.

Zero-Coupon Bonds

Not all debt obligations make periodic coupon interest payments. Debt instruments that are not contracted to make periodic coupon payments are called *zero-coupon instruments*. The holder of a zero-coupon instrument realizes interest income by buying it substantially below its par value. Interest then is paid at the maturity date, with the interest earned by the investor being the difference between the par value and the price paid for the debt instrument. So, for example, if an investor purchases a zero-coupon instrument for 70, the interest realized at the maturity date is 30. This is the difference between the par value (100) and the price paid (70).

There are bonds that are issued as zero-coupon instruments. Moreover, in the money market there are several types of debt instruments that are issued as discount instruments. These are discussed in Chapter 6.

There is another type of debt obligation that does not pay interest until the maturity date. This type has contractual coupon payments, but those payments are accrued and distributed along with the maturity value at the maturity date. These instruments are called *accrued coupon instruments* or *accrual securities* or *compound interest securities*.

Floating-Rate Securities

The coupon rate on a debt instrument need not be fixed over its lifetime. *Floating-rate securities*, sometimes called *floaters* or *variable-rate securities*, have coupon payments that reset periodically according to some reference rate. The typical formula for the coupon rate on the dates when the coupon rate is reset is:

$$\text{Reference rate} \pm \text{Quoted margin}$$

The quoted margin is the additional amount that the issuer agrees to pay above the reference rate (if the quoted margin is positive) or the amount less than the reference rate (if the quoted margin is negative). The quoted margin is expressed in terms of *basis points*. A basis point is equal to 0.0001 or 0.01%. Thus, 100 basis points are equal to 1%.

To illustrate a coupon reset formula, suppose that the reference rate is the 1-month London interbank offered rate (LIBOR)—an interest rate described in Chapter 6. Suppose that the quoted margin is 150 basis points. Then the coupon reset formula is:

$$\text{1-month LIBOR} + 150 \text{ basis points}$$

So, if 1-month LIBOR on the coupon reset date is 5.5%, the coupon rate is reset for that period at 7% (5% plus 200 basis points).

The reference rate for most floating-rate securities is an interest rate or an interest rate index. There are some issues where this is not the case. Instead, the reference rate is the rate of return on some financial index such as one of the stock market indexes discussed in Chapter 4. There are debt obligations whose coupon reset formula is tied to an inflation index. These instruments are described in Chapter 8.

Typically, the coupon reset formula on floating-rate securities is such that the coupon rate increases when the reference rate increases, and decreases when the reference rate decreases. There are issues whose coupon rate moves in the opposite direction from the change in the reference rate. Such issues are called *inverse floaters* or *reverse floaters*.

A floating-rate debt instrument may have a restriction on the maximum coupon rate that will be paid at a reset date. The maximum coupon rate is called a *cap*.

Because a cap restricts the coupon rate from increasing, a cap is an unattractive feature for the investor. In contrast, there could be a minimum coupon rate specified for a floating-rate security. The minimum coupon rate is called a *floor*. If the coupon reset formula produces a coupon rate that is below the floor, the floor is paid instead. Thus, a floor is an attractive feature for the investor.

Provisions for Paying off Debt Instruments

The issuer/borrower of a debt instrument agrees to repay the principal by the stated maturity date. The issuer/borrower can agree to repay the entire amount borrowed in one lump sum payment at the maturity date. That is, the issuer/borrower is not required to make any principal repayments prior to the maturity date. Such bonds are said to have a *bullet maturity*. An issuer may be required to retire a specified portion of an issue each year. This is referred to as a *sinking fund requirement*.

There are loans, mortgage-backed securities, and asset-backed securities pools of loans that have a schedule of principal repayments that are made prior to the final maturity of the instrument. Such debt instruments are said to be *amortizing instruments*.

There are debt instruments that have a *call provision*. This provision grants the issuer/borrower an option to retire all or part of the issue prior to the stated maturity date. Some issues specify that the issuer must retire a predetermined amount of the issue periodically. Various types of call provisions are discussed below.

Call and Refunding Provisions

A borrower generally wants the right to retire a debt instrument prior to the stated maturity date because it recognizes that at some time in the future the general level of interest rates may fall sufficiently below the coupon rate so that redeeming the issue and replacing it with another debt instrument with a lower coupon rate would be economically beneficial. This right is a disadvantage to the investor since proceeds received must be reinvested at a lower interest rate. As a result, a borrower who wants to include this right as part of a debt instrument must compensate the investor when the issue is sold by offering a higher coupon rate.

The right of the borrower to retire the issue prior to the stated maturity date is referred to as a “call option.” If the borrower exercises this right, the issuer is said to “call” the debt instrument. The price that the borrower must pay to retire the issue is referred to as the *call price*.

When a debt instrument is issued, typically the borrower may not call it for a number of years. That is, the issue is said to have a *deferred call*. The date at which the debt instrument may first be called is referred to as the *first call date*.

If a bond issue does not have any protection against early call, then it is said to be a *currently callable issue*. But most new bond issues, even if currently callable, usually have some restrictions against certain types of early redemption. The most common restriction is prohibiting the refunding of the bonds for a certain number of years. *Refunding* a bond issue means redeeming bonds with funds obtained through the sale of a new bond issue.

Many investors are confused by the terms noncallable and nonrefundable. Call protection is much more absolute than refunding protection. While there may be certain exceptions to absolute or complete call protection in some cases, it still provides greater assurance against premature and unwanted redemption than does refunding protection. Refunding prohibition merely prevents redemption only from certain sources of funds, namely the proceeds of other debt issues sold at a lower

cost of money. The bondholder is only protected if interest rates decline, and the borrower can obtain lower-cost money to pay off the debt.

Prepayments

For amortizing instruments—such as loans and securities that are backed by loans—there is a schedule of principal repayments but individual borrowers typically have the option to pay off all or part of their loan prior to the scheduled date. Any principal repayment prior to the scheduled date is called a *prepayment*. The right of borrowers to prepay is called the prepayment option. Basically, the prepayment option is the same as a call option.

Options Granted to Bondholders

There are provisions in debt instruments that give either the investor and/or the issuer an option to take some action against the other party. The most common type of embedded option is a call feature, which was discussed earlier. This option is granted to the issuer. There are two options that can be granted to the owner of the debt instrument: the right to put the issue and the right to convert the issue.

A debt instrument with a *put provision* grants the investor the right to sell it back to the borrower at a specified price on designated dates. The specified price is called the *put price*. The advantage of the put provision to the investor is that if after the issuance date of the debt instrument market interest rates rise above the debt instrument's coupon rate, the investor can force the borrower to redeem the bond at the put price and then reinvest the proceeds at the prevailing higher rate.

A convertible debt instrument is one that grants the investor the right to convert or exchange the debt instrument for a specified number of shares of common stock. Such a feature allows the investor to take advantage of favorable movements in the price of the borrower's common stock or equity.

VALUATION OF A FINANCIAL INSTRUMENT

Valuation is the process of determining the fair value of a financial instrument. Valuation is also referred to as “pricing” a financial instrument. Once this process is complete, we can compare a financial instrument's computed fair value as determined by the valuation process to the price at which it is trading for in the market (i.e., the market price). Based on this comparison, an investor will be able to assess the investment merit of a financial instrument.

There are three possibilities summarized below along with their investment implications.

Market Price versus Fair Value	Investment Implications
Market price equal to fair value	Financial instrument is fairly priced
Market price is less than fair value	Financial instrument is undervalued
Market price is greater than fair value	Financial instrument is overvalued

A financial instrument that is undervalued is said to be “trading cheap” and is a candidate for purchase. If a financial instrument is overvalued, it is said to be “trading rich.” In this case, an investor should sell the financial instrument if he or she already owns it. Or, if the financial instrument is not owned, it is possible for the investor to sell it anyway. Selling a financial instrument that is not owned is a common practice in some markets. This market practice is referred to as “selling short.” We will discuss the mechanics of selling short in Chapter 4. The two reasons why we say that it is possible for an investor to sell short are (1) the investor must be permitted or authorized to do so and (2) the market for the financial instrument must have a mechanism for short selling.

FINANCIAL MARKETS

A financial market is a market where financial instruments are exchanged (i.e., traded). Although the existence of a financial market is not a necessary condition for the creation and exchange of a financial instrument, in most economies financial instruments are created and subsequently traded in some type of financial market. The market in which a financial asset trades for immediate delivery is called the *spot market* or *cash market*.

Role of Financial Markets

Financial markets provide three major economic functions. First, the interactions of buyers and sellers in a financial market determine the price of the traded asset. Or, equivalently, they determine the required return on a financial instrument. Because the inducement for firms to acquire funds depends on the required return that investors demand, it is this feature of financial markets that signals how the funds in the financial market should be allocated among financial instruments. This is called the *price discovery process*.

Second, financial markets provide a mechanism for an investor to sell a financial instrument. Because of this feature, it is said that a finan-

cial market offers “liquidity,” an attractive feature when circumstances either force or motivate an investor to sell. If there were not liquidity, the owner would be forced to hold a financial instrument until the issuer initially contracted to make the final payment (i.e., until the debt instrument matures) and an equity instrument until the company is either voluntarily or involuntarily liquidated. While all financial markets provide some form of liquidity, the degree of liquidity is one of the factors that characterize different markets.

The third economic function of a financial market is that it reduces the cost of transacting. There are two costs associated with transacting: search costs and information costs. *Search costs* represent explicit costs, such as the money spent to advertise one’s intention to sell or purchase a financial instrument, and implicit costs, such as the value of time spent in locating a counterparty. The presence of some form of organized financial market reduces search costs. *Information costs* are costs associated with assessing the investment merits of a financial instrument, that is, the amount and the likelihood of the cash flow expected to be generated. In a price efficient market, prices reflect the aggregate information collected by all market participants.

Classification of Financial Markets

There are many ways to classify financial markets. One way is by the type of financial claim, such as debt markets and equity markets. Another is by the maturity of the claim. For example, the money market is a financial market for short-term debt instruments; the market for debt instruments with a maturity greater than one year and equity instruments is called the *capital market*.

Financial markets can be categorized as those dealing with financial claims that are newly issued, called the *primary market*, and those for exchanging financial claims previously issued, called the *secondary market* or the market for seasoned instruments.

Markets are classified as either *cash markets* or *derivative markets*. The latter is described later in this chapter. A market can be classified by its organizational structure: It may be an *auction market* or an *over-the-counter market*. We describe these organizational structures when we discuss the market for common stocks in Chapter 4.

BORROWING FUNDS TO PURCHASE FINANCIAL INSTRUMENTS

Some investors follow a policy of borrowing a portion or all of the funds to buy financial instruments. By doing so an investor is creating

financial leverage or simply leverage. We first describe the principle of leverage and then explain how an investor can create a leveraged position in financial markets.

Principles of Leverage

The objective in leveraging is to earn a higher return on the funds borrowed than it cost to borrow those funds. The disadvantage is that if the funds borrowed earn less than the cost of the borrowed funds, then the investor would have been better off without borrowing.

Here is a simple example. Suppose an investor can invest \$100,000 today in a financial instrument. The investor puts up his own funds to purchase the financial instrument and this amount is referred to as the *investor's equity*. Suppose that the financial instrument at the end of one year provides a cash payment to the investor of \$5,000. Also assume that the value of the financial instrument has appreciated from \$100,000 to \$110,000. Thus, the investor's return is \$5,000 in the form of a cash payment plus capital appreciation of \$10,000 for a total of \$15,000. The return this investor realized is 15% on the \$100,000 investment. Instead of an appreciation in price for the financial instrument, suppose its value declined to \$97,000. Then the investor's return would be \$2,000 (\$5,000 cash payment less the depreciation in the value of the financial instrument of \$3,000) or a 2% return.

Now let's see where leverage comes in. Suppose that our investor can borrow another \$100,000 to purchase an additional amount of the financial instrument. Consequently, \$200,000 is invested, \$100,000 of which is the investor's equity and \$100,000 of which is borrowed funds. Let's suppose that the cost of borrowing the \$100,000 is 7%. In the case where the financial instrument appreciated, the investor's return on equity is summarized below:

Investment in financial instrument	= \$200,000
Cash payment	= \$10,000
Values of financial instrument at end of year	= \$220,000
Appreciation in value of financial instrument	= \$20,000
Cost of borrowed funds = $7\% \times \$100,000$	
Dollar return = $\$10,000 + \$20,000 - \$7,000$	= \$23,000
Return on investor's equity = $\$23,000 / \$100,000$	= 23%

Thus the investor increased the return on equity from 15% (when no funds were borrowed) to 23% (when \$100,000 was borrowed). The reason should be obvious. The investor borrowed \$100,000 at a cost of 7% and then earned on the \$100,000 borrowed 15%. The difference of 8% between the return earned on the money borrowed and the cost of

the money borrowed accrued to the benefit of the investor in terms of increasing the return on equity.

Let's try this one more time assuming that the investor borrowed \$200,000 at a cost of 7% and the value of the financial instruments increased. The results are summarized below:

Investment in financial instrument	= \$300,000
Cash payment	= \$15,000
Value of financial instrument at end of year	= \$330,000
Appreciation in value of financial instrument	= \$30,000
Cost of borrowed funds = $7\% \times \$200,000$	= \$14,000
Dollar return = $\$15,000 + \$30,000 - \$14,000$	= \$31,000
Return on investor's equity = $31\% (= \$31,000/\$100,000)$	

By borrowing \$200,000, the investor has increased the return on equity compared to the case of no borrowing or borrowing just \$100,000.

That is the good news and occurs if the return earned on the borrowed funds exceeds the cost of borrowing. But there is a risk that this will not occur. For example, take the case where the investor borrows \$100,000 but the financial instrument's value declines. Then we have the following situation:

Investment in financial instrument	= \$200,000
Cash payment	= \$10,000
Value of financial instrument at end of year	= \$194,000
Depreciation in value of financial instrument	= \$6,000
Cost of borrowed funds = $7\% \times \$100,000$	= \$7,000
Dollar return = $\$10,000 - 6,000 - \$7,000$	= -\$3,000
Return on investor's equity = $-3\% (= -\$3,000/\$100,000)$	

The return on investor's equity in this case is -3%. This is less than the investor would have realized if no funds were borrowed (2%). The reason is that the investor earned 2% on the \$100,000 borrowed and had to pay 7% to borrow the funds. The difference of 5% between the cost of borrowing and the return on the \$100,000 borrowed works against the investor in terms of reducing the return on the investor's equity.

It is easy to see why the more borrowed in this scenario, the more it would have decreased the return on investor's equity.

Collateralized Borrowing in the Financial Markets

How does an investor create leverage? One obvious way is to take out a loan from a financial institution. However, there is a standard mechanism in most sectors of the financial market that allows an investor to

create leverage. The investor can use the financial instrument purchased with the borrowed funds as collateral for the loan.

In the stock market, the form of collateralized borrowing is referred to as “buying on margin.” This will be explained in Chapter 4. In the bond market, there are various forms of collateralized borrowing. For individual investors, typically the mechanism is buying on margin. For institutional investors, a repurchase agreement is used. This agreement will be explained in Chapter 6. It is actually a short-term investment to the entity that wants to lend funds (hence it is called a money market instrument) and a source of funds for an investor who wants a collateralized loan.

There is a specialized type of repurchase agreement in the mortgage-backed securities market called a dollar roll. This will be explained in Chapter 14.

DERIVATIVE MARKETS

So far we have focused on the cash market for financial instruments. With some financial instruments, the contract holder has either the obligation or the choice to buy or sell a financial instrument at some future time. The price of any such contract derives its value from the value of the underlying financial instrument, financial index, or interest rate. Consequently, these contracts are called *derivative instruments*.

The primary role of derivative instruments is to provide investors with an inexpensive way of controlling some of the major risks that we will describe in this book. We will take a closer look at this in Chapter 28. Unfortunately, derivative instruments are too often viewed by the general public—and sometimes regulators and legislative bodies—as vehicles for pure speculation (that is, legalized gambling). Without derivative instruments and the markets in which they trade, the financial systems throughout the world would not be as efficient or integrated as they are today.¹

¹ A May 1994 report published by the U.S. General Accounting Office (GAO) titled *Financial Derivatives: Actions Needed to Protect the Financial System* recognized the importance of derivatives for market participants. Page 6 of the report states:

Derivatives serve an important function of the global financial marketplace, providing end-users with opportunities to better manage financial risks associated with their business transactions. The rapid growth and increasing complexity of derivatives reflect both the increased demand from end-users for better ways to manage their financial risks and the innovative capacity of the financial services industry to respond to market demands.

Types of Derivative Instruments

The two basic types of derivative instruments are futures/forward contracts and options contracts. A *futures contract* or *forward contract* is an agreement whereby two parties agree to transact with respect to some financial instrument at a predetermined price at a specified future date. One party agrees to buy the financial instrument; the other agrees to sell the financial instrument. Both parties are obligated to perform, and neither party charges a fee. The distinction between a futures and forward contract is explained in Chapter 29.

An *option contract* gives the owner of the contract the right, but not the obligation, to buy (or sell) a financial instrument at a specified price from (or to) another party. The buyer of the contract must pay the seller a fee, which is called the *option price*. When the option grants the owner of the option the right to buy a financial instrument from the other party, the option is called a call option. If, instead, the option grants the owner of the option the right to sell a financial instrument to the other party, the option is called a put option. Options are more fully explained in Chapter 28.

Derivative instruments are not limited to financial instruments. In this book we will describe derivative instruments where the underlying asset is a financial asset, or some financial benchmark such as a stock index or an interest rate, or a credit spread. Moreover, there are other types of derivative instruments that are basically “packages” of either forward contracts or option contracts. These include swaps, caps, and floors, all of which are discussed in Chapter 29).

