CHAPTER 3

The Global Market Investment Decision*

After you read this chapter, you should be able to answer the following questions:

- Why should investors have a global perspective regarding their investments?
- What has happened to the relative size of U.S. and foreign stock and bond markets?
- What are the differences in the rates of return on U.S. and foreign securities markets?
- How can changes in currency exchange rates affect the returns that U.S. investors experience on foreign securities?
- Is there additional advantage to diversifying in international markets beyond the benefits of domestic diversification?
- What alternative securities are available? What are their cash flow and risk properties?
- What are the historical return and risk characteristics of the major investment instruments?
- What is the relationship among the returns for foreign and domestic investment instruments?
- What is the implication of these relationships for portfolio diversification?

Individuals are willing to defer current consumption for many reasons. Some save for their children's college tuition or their own; others wish to accumulate down payments for a home, car, or boat; others want to amass adequate retirement funds for the future. Whatever the reasons for an investment program, the techniques we used in Chapter 1 to measure risk and return will help you evaluate alternative investments.

But what are those alternative investments? Thus far, we have said little about the investment opportunities available in financial markets. In this chapter, we address this issue by surveying investment alternatives. This is essential background for making the asset allocation decision discussed in Chapter 2 and for later chapters where we analyze several individual investments, such as bonds, common stock, and other securities. It is also important when we consider how to construct and evaluate portfolios of investments.

As an investor in the 21st century, you have an array of investment choices unavailable a few decades ago. As discussed by Miller (1991), a combination of dynamic financial markets, technological advances, and new regulations have resulted in numerous new investment instruments and expanded trading opportunities. Improvements in communications and relaxation of international regulations have made it easier for investors to trade in both domestic and global markets. Telecommunications networks enable U.S. brokers to reach security exchanges in London, Tokyo, and other European and Asian cities as easily as those in New York, Chicago, and other U.S. cities. The competitive environment in the brokerage industry and the deregulation of the banking sector have made it possible for more financial institutions to compete for investor dollars.

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All of his has spawned investment vehicles with a variety of maturities, risk-return characteristics, and cash flow patterns. In this chapter, we examine some of these choices.

As an investor, you need to understand the differences among investments so you can build a properly diversified **portfolio** that conforms to your objectives. That is, you should seek to acquire a group of investments with different patterns of returns over time. If chosen carefully, such portfolios minimize risk for a given level of return because low or negative rates of return on some investments during a period of time are offset by above-average returns on others. Your goal should be to build a balanced portfolio of investments with relatively stable overall rates of return. A major goal of this text is to help you understand and evaluate the risk-return characteristics of investment portfolios. An appreciation of alternative security types is the starting point for this analysis.

This chapter is divided into three main sections. Because investors can choose securities from around the world, we initially look at a combination of reasons why investors *should* include foreign as well as domestic securities in their portfolios. Taken together, these reasons provide a compelling case for global investing.

In the second section of this chapter, we discuss securities in domestic and global markets, describing their main features and cash flow patterns. You will see that the varying risk-return characteristics of alternative investments suit the preferences of different investors.

The third and final section contains the historical risk and return performance of several investment instruments from around the world and examines the relationship among the returns for many of these securities. These results provide strong empirical support for global investing.

3.2 Global Investment Choices

This section provides an important foundation for subsequent chapters in which we describe techniques to value individual investments and combine alternative investments into properly diversified portfolios that conform to your risk-return objectives. In this section, we briefly describe the numerous investment alternatives available. This survey introduces each of these investment alternatives so you can appreciate the full spectrum of opportunities. Most of these assets will be described in greater detail in subsequent chapters.

The investments are divided by asset classes. First, we describe fixed-income investments, including bonds and preferred stocks. In the second subsection, we discuss equity investments, and the third subsection contains a discussion of special equity instruments, such as warrants and options, which have characteristics of both fixed-income and equity instruments. In subsection four, we consider futures contracts that allow for a wide range of return-risk profiles. The fifth subsection considers investment companies.

All these investments are called *financial assets* because their payoffs are in money. In contrast, *real assets*, such as real estate, are discussed in the sixth subsection. We conclude with assets that are considered *low liquidity investments* because of the relative difficulty in buying and selling them. This includes art, antiques, coins, stamps, and precious gems.

The final section of the chapter presents the historical return and risk patterns for many individual investment alternatives and the correlations among the returns for these investments. This additional background and perspective will help you evaluate individual investments in order to build a properly diversified portfolio of global investments.

3.2.1 Fixed-Income Investments

Fixed-income investments have a contractually mandated payment schedule. Their investment contracts promise specific payments at predetermined times, although the legal force behind the promise varies and this affects their risks and required returns. At one extreme, if the issuing firm does not make its payment at the appointed time, creditors can declare the issuing firm in default. In other cases (for example, income bonds), the issuing firm must make payments only if it earns profits. In yet other instances (for example, preferred stock), the issuing firm does not have to make dividend payments unless its board of directors votes to do so.

Investors who acquire fixed-income securities (except preferred stock) are really lenders to the issuers. Specifically, you lend some amount of money, the *principal*, to the borrower. In return, the borrower typically promises to make periodic interest payments and to pay back the principal at the maturity of the loan.

Savings Accounts You might not think of savings accounts as fixed-income investments, yet an individual who deposits funds in a savings account at a financial institution is really lending money to the institution and, as a result, earning a fixed payment. These investments are considered to be convenient, liquid, and low risk because almost all are insured. Consequently, their rates of return are generally low compared with other alternatives. Several versions of these accounts have been developed to appeal to investors with differing objectives.

Passbook savings accounts have no minimum balance, and funds may be withdrawn at any time with little loss of interest. Due to their flexibility, the promised interest on passbook accounts is relatively low.

For investors with larger amounts of funds who are willing to give up liquidity, financial institutions developed **certificates of deposit (CDs)**, which require minimum deposits (typically $500) and have fixed durations (usually three months, six months, one year, two years). The promised rates on CDs are higher than those for passbook savings accounts, and the rate increases with the size and the duration of the deposit. An investor who wants to cash in a CD prior to its stated expiration date must pay a heavy penalty in the form of a much lower interest rate.

Investors with large sums of money ($10,000 or more) can invest in Treasury bills (T-bills)—short-term obligations (maturing in 3–12 months) of the U.S. government. To compete against T-bills, banks issue money market certificates, which require minimum investments of $10,000 and have minimum maturities of six months. The promised rate on these certificates fluctuates at some premium over the weekly rate on six-month T-bills. Investors can redeem these certificates only at the bank of issue, and they incur penalties if they withdraw their funds before maturity.

Capital Market Instruments **Capital market instruments** are fixed-income obligations that trade in the secondary market, which means you can buy and sell them to other individuals or institutions. Capital market instruments fall into four categories: (1) U.S. Treasury securities, (2) U.S. government agency securities, (3) municipal bonds, and (4) corporate bonds.

U.S. Treasury Securities All government securities issued by the U.S. Treasury are fixed-income instruments. They may be bills, notes, or bonds depending on their initial times to maturity. Specifically, bills mature in one year or less, notes in over one to 10 years, and bonds in more than 10 years from time of issue. U.S. government obligations are essentially free of credit risk because there is little chance of default and they are highly liquid.

U.S. Government Agency Securities Agency securities are sold by various agencies of the government to support specific programs, but they are not direct obligations of the Treasury. Examples of agencies that issue these bonds include the Federal National Mortgage Association (FNMA or Fannie Mae), and the Federal Home Loan Mortgage Corporation (Freddie Mac) which sells bonds and uses the proceeds to purchase mortgages from insurance companies or

savings and loans; and the Federal Home Loan Bank (FHLB), which sells bonds and loans the money to its 12 banks, which in turn provide credit to savings and loans and other mortgage-granting institutions. Other agencies are the Government National Mortgage Association (GNMA or Ginnie Mae), Banks for Cooperatives, Federal Land Banks (FLBs), and the Federal Housing Administration (FHA).

Although the securities issued by federal agencies (except GNMA) are not direct obligations of the government (they are not officially guaranteed by the Treasury), they have been considered default-free because it was believed that the government would not allow them to default.[1]

Municipal Bonds Municipal bonds are issued by local government entities as either general obligation or revenue bonds. General obligation bonds (GOs) are backed by the full taxing power of the municipality. In contrast, revenue bonds pay the interest from revenue generated by specific projects (e.g., the revenue to pay the interest on sewer bonds comes from water taxes).

Municipal bonds differ from other fixed-income securities because they are tax-exempt. The interest earned from them is exempt from taxation by the federal government and historically by some states that issued the bond, provided the investor is a resident of that state. For this reason, municipal bonds are popular with investors in high tax brackets. For an investor having a marginal tax rate of 35 percent, a regular bond with an interest rate of 8 percent yields a net return after taxes of only 5.20 percent [$0.08 \times (1 - 0.35)$]. Such an investor would prefer a tax-free bond of equal risk with a 6 percent yield. This allows municipal bonds to offer yields that are generally 20 to 30 percent lower than yields on comparable taxable bonds. As will be discussed in Chapter 17, this relationship changed temporarily in 2010 and 2011 for several reasons. We will also discuss taxable municipal bonds.

Corporate Bonds Corporate bonds are fixed-income securities issued by industrial corporations, public utility corporations, or railroads to raise funds to invest in plant, equipment, or working capital. They can be broken down by issuer (industrial or utility), in terms of credit quality (measured by the ratings assigned by an agency on the basis of probability of default), in terms of maturity (short term, intermediate term, or long term), or based on some component of the indenture (sinking fund or call feature). Historically, corporate bonds have been substantially less liquid than Treasury or agency bonds, but the difference has declined due to real-time quotes for about 6,000 bonds on the NYSE and improved acquisition alternatives, described by Kim (2007).

All bonds include an **indenture**, which is the legal agreement that lists the obligations of the issuer to the bondholder, including the payment schedule and features such as call provisions and sinking funds. **Call provisions** specify when a firm can issue a call for the bonds prior to their maturity, at which time current bondholders must submit the bonds to the issuing firm, which redeems them (that is, pays back the principal and a small premium). A **sinking fund** provision specifies payments the issuer must make to redeem a given percentage of the outstanding issue prior to maturity.

Corporate bonds fall into various categories based on their contractual promises to investors. They will be discussed in order of their seniority.

Secured bonds are the most senior bonds in a firm's capital structure and have the lowest risk of distress or default. They include various secured issues that differ based on the assets that are pledged. **Mortgage bonds** are backed by liens on specific assets, such as land and buildings. In the case of default, the proceeds from the sale of these assets are used to pay off the mortgage bondholders. **Collateral trust bonds** are a form of mortgage bond except that the assets backing the bonds are financial assets, such as stocks, notes, and other high-quality

[1]During the market crash of 2006–2009, this belief was tested when Fannie and Freddie were taken over by the federal government. This set of events will be discussed further in Chapter 17.

bonds. Finally, **equipment trust certificates** are mortgage bonds that are secured by specific pieces of transportation equipment, such as locomotives and boxcars for a railroad and airplanes for an airline.

Debentures are promises to pay interest and principal, but they pledge no specific assets (referred to as *collateral*) in case the firm does not fulfill its promise. This means that the bondholder depends on the success of the borrower to make the promised payment. Debenture owners usually have first call on the firm's earnings and *any assets that are not already pledged by the firm as backing for senior secured bonds*. If the issuer does not make an interest payment, the debenture owners can declare the firm bankrupt and claim any unpledged assets to pay off the bonds.

Subordinated bonds are similar to debentures, but, in the case of default, subordinated bondholders have claim to the assets of the firm only after the firm has satisfied the claims of all senior secured and debenture bondholders. That is, the claims of subordinated bondholders are secondary to those of other bondholders. Within this general category of subordinated issues, you can find senior subordinated, subordinated, and junior subordinated bonds. Junior subordinated bonds have the weakest claim of all bondholders.

Income bonds stipulate interest payment schedules, but the interest is due and payable only if the issuers earn the income to make the payment by stipulated dates. If the company does not earn the required amount, it does not have to make the interest payment and it cannot be declared in default. Instead, the interest payment is considered in arrears and, if subsequently earned, it must be paid off. Because the issuing firm is not legally bound to make its interest payments except when the firm earns it, an income bond is not considered as safe as a debenture or a mortgage bond, so income bonds offer higher returns to compensate investors for the added risk. There are a limited number of corporate income bonds. In contrast, income bonds are fairly popular with municipalities because municipal revenue bonds discussed previously are basically income bonds.

Convertible bonds have the interest and principal characteristics of other bonds, with the added feature that the bondholder has the option to turn them back to the firm in exchange for its common stock. For example, a firm could issue a $1,000 face-value bond and stipulate that owners of the bond could turn the bond in to the issuing corporation and convert it into 40 shares of the firm's common stock. These bonds appeal to investors because they combine the features of a fixed-income security with the option of conversion into the common stock of the firm, should the firm prosper.

Because of their desirable conversion option, convertible bonds generally pay lower interest rates than nonconvertible debentures of comparable risk. The difference in the required interest rate increases with the growth potential of the company because this growth potential increases the value of the option to convert the bonds into common stock. These bonds are almost always subordinated to the nonconvertible debt of the firm, so they are considered to have higher credit risk and receive a lower credit rating from the bond rating firms.

An alternative to convertible bonds is a debenture with warrants attached. The **warrant** is likewise an option that allows the bondholder to purchase the firm's common stock from the firm at a specified price for a given time period. The specified purchase price for the stock set in the warrant is typically above the price of the stock at the time the firm issues the bond but below the expected future stock price. The warrant makes the debenture more desirable, which lowers its required yield. The warrant also provides the firm with future common stock capital because when the bond holder exercises the warrant, he/she buys the stock from the firm.

Unlike the typical bond that pays interest every six months and its face value at maturity, a **zero coupon bond** promises no interest payments during the life of the bond but only the payment of the principal at maturity. Therefore, the purchase price of the bond is the present

value of the principal payment at the required rate of return. For example, the price of a zero coupon bond that promises to pay $10,000 in five years with a required rate of return of 8 percent is $6,756. To find this, assuming semiannual compounding (which is the norm), use the present value factor for 10 periods at 4 percent, which is 0.6756.

Preferred Stock **Preferred stock** is classified as a fixed-income security because its yearly payment is stipulated as either a coupon (for example, 5 percent of the face value) or a stated dollar amount (for example, $5 preferred). Preferred stock differs from bonds because its payment is a dividend and therefore not legally binding. For each period, the firm's board of directors must vote to pay it, similar to a common stock dividend. Even if the firm earned enough money to pay the preferred stock dividend, the board of directors could theoretically vote to withhold it. Because most preferred stock is cumulative, the unpaid dividends would accumulate to be paid in full at a later time.

Although preferred dividends are not legally binding, as are the interest payments on a bond, they are considered *practically* binding because of the credit implications of a missed dividend. Because corporations can exclude 80 percent of intercompany dividends from taxable income, preferred stocks have become attractive investments for financial corporations. For example, a corporation that owns preferred stock of another firm and receives $100 in dividends can exclude 80 percent of this amount and pay taxes on only 20 percent of it ($20). Assuming a 40 percent tax rate, the tax would only be $8 or 8 percent versus 40 percent on other investment income. Due to this tax benefit to corporations, the yield on high-grade preferred stock is typically lower than that on high-grade bonds.

3.2.2 International Bond Investing

As noted earlier, more than half of all fixed-income securities available to U.S. investors are issued by firms in countries outside the United States. Investors identify these securities in different ways: by the country or city of the issuer (for example, United States, United Kingdom, Japan); by the location of the primary trading market (for example, United States, London); by the home country of the major buyers; and by the currency in which the securities are denominated (for example, dollars, yen, euros). We identify foreign bonds by their country of origin and include these other differences in each description.

A **Eurobond** is an international bond denominated in a currency not native to the country where it is issued. Specific kinds of Eurobonds include Eurodollar bonds, Euroyen bonds, and Eurosterling bonds. A Eurodollar bond is denominated in U.S. dollars and sold outside the United States to non-U.S. investors. A specific example would be a U.S. dollar bond issued by General Electric and sold in London. Eurobonds are typically issued in Europe, with the major concentration in London.

Eurobonds can also be denominated in yen. For example, Nippon Steel can issue Euroyen bonds for sale in London. Also, if it appears that investors are looking for a specific foreign currency bonds, a U.S. corporation can issue a Euroyen bond in London.

Yankee bonds are sold in the United States, denominated in U.S. dollars, but issued by foreign corporations or governments. This allows a U.S. citizen to buy the bond of a foreign firm or government but receive all payments in U.S. dollars, eliminating exchange rate risk.

An example would be a U.S. dollar-denominated bond issued by British Airways. Similar **foreign bonds** are issued in other countries, including the Bulldog Market, which involves British sterling-denominated bonds issued in the United Kingdom by non-British firms, or the Samurai Market, which involves yen-denominated bonds issued in Japan by non-Japanese firms.

International domestic bonds are sold by an issuer within its own country in that country's currency. An example would be a bond sold by Nippon Steel in Japan denominated in

yen. A U.S. investor acquiring such a bond would receive maximum diversification but would incur the exchange rate risk of Japanese currency.

3.2.3 Equity Instruments

This section describes several equity instruments, which differ from fixed-income securities because their returns are not contractual. As a result, you can receive returns that are much better or much worse than what you would receive on a bond. We begin with common stock, the most popular equity instrument and probably the most popular investment instrument.

Common stock represents *ownership* of a firm. Owners of the common stock of a firm share in the company's successes and problems. If—like Walmart, Microsoft, Google, or Apple—the company prospers, the investor receives high rates of return and can become wealthy. In contrast, the investor can lose money if the firm does not do well or even goes bankrupt, as the once formidable K-Mart, Enron, W. T. Grant, and several U.S. airlines all did. In these instances, the firm may be forced to liquidate its assets and pay off all its creditors. Notably, the firm's preferred stockholders and common stock owners receive what is left, which is usually little or nothing. Investing in common stock entails all the advantages and disadvantages of ownership and is a relatively risky investment compared with fixed-income securities. As shown, this is reflected in relative return volatility.

Common Stock Classifications When considering an investment in common stock, people tend to divide the vast universe of stocks into categories based on general business lines and by industry within these business lines. The division includes broad classifications for industrial firms, utilities, transportation firms, and financial institutions. Within each of these broad classes are specific industries. The industrial group, which is very diverse, includes such industries as automobiles, industrial machinery, chemicals, and beverages. Utilities include electrical power companies, gas suppliers, and the water industry. Transportation includes airlines, trucking firms, and railroads. Financial institutions include commercial banks, insurance companies, and investment firms.

An alternative classification scheme might separate domestic (U.S.) and foreign common stocks. We avoid this division because the business line-industry breakdown is more appropriate and useful when constructing a diversified portfolio of global common stock investments. With a global capital market, the focus of analysis should include all the companies in an industry viewed in a global setting. The point is, it is not relevant whether a major chemical firm is located in the United States or Germany, just as it is not relevant whether a computer firm is located in Michigan or California. Therefore, when considering the automobile industry, it is necessary to go beyond pure U.S. auto firms like General Motors and Ford and consider auto firms from throughout the world, such as Honda Motors, Porsche, Daimler, Nissan, Toyota, and Fiat.

Acquiring Foreign Equities We begin our discussion on foreign equities by considering how you buy and sell these securities because this procedural information has often been a major impediment. Many investors may recognize the desirability of investing in foreign common stock because of the risk and return characteristics discussed earlier, but they may be intimidated by the logistics of the transaction. This section attempts to alleviate this concern by explaining the alternatives available. Currently, there are several ways to acquire foreign common stock:

1. Purchase or sale of American Depository Receipts (ADRs)
2. Purchase or sale of American shares
3. Direct purchase or sale of foreign shares listed on a U.S. or foreign stock exchange
4. Purchase or sale of international or global mutual funds or exchange-traded funds (ETFs)

Purchase or Sale of American Depository Receipts The easiest way to acquire shares of an individual foreign company directly is through **American Depository Receipts (ADRs)**. These are certificates of ownership issued by a U.S. bank that represent indirect ownership of a certain number of shares of a specific foreign firm on deposit in a bank in the firm's home country. ADRs are a convenient way to own foreign shares because the investor buys and sells them in U.S. dollars and receives all dividends in U.S. dollars. Therefore, the price and returns reflect both the domestic returns for the stock and the exchange rate effect. Also, the price of an ADR can reflect the fact that it represents multiple shares—for example, an ADR can be for 5 or 10 shares of the foreign stock. ADRs can be issued at the discretion of a bank based on the demand for the stock. The shareholder absorbs the additional handling costs of an ADR through higher transfer expenses, which are deducted from dividend payments.

ADRs are quite popular in the United States because of their diversification benefits, as documented by Wahab and Khandwala (1993). At the end of 2010, 474 foreign companies had stocks listed on the New York Stock Exchange (NYSE) and 361 of these were available through ADRs, including all the stock listed from Japan, the United Kingdom, Australia, Mexico, and the Netherlands.

Purchase or Sale of American Shares American shares are securities issued in the United States by a transfer agent acting on behalf of a foreign firm. Because of the added effort and expense incurred by the foreign firm, a limited number of American shares are available.

Direct Purchase or Sale of Foreign Shares The most difficult and complicated foreign equity transaction takes place in the country where the firm is located because it must be carried out in the foreign currency and the shares must then be transferred to the United States. This routine can be cumbersome. A second alternative is a transaction on a foreign stock exchange outside the country where the securities originated. For example, if you acquired shares of a French auto company listed on the London Stock Exchange (LSE), the shares would be denominated in pounds and the transfer would be swift, assuming your broker has a membership on the LSE.

Finally, you could purchase foreign stocks listed on the NYSE or NASDAQ. This is similar to buying a U.S. stock, but only a limited number of foreign firms qualify for—and are willing to accept—the cost of listing. Still, this number is growing. At the end of 2010, more than 110 foreign firms (mostly Canadian) were directly listed on the NYSE, in addition to the firms that were available through ADRs. Also, many foreign firms are traded on the NASDAQ market.

Purchase or Sale of Global Mutual Funds or ETFs Numerous mutual funds or exchange-traded funds (ETFs) make it possible for investors to indirectly acquire the stocks of firms from outside the United States. The alternatives range from *global funds*, which invest in both U.S. stocks and foreign stocks, to *international funds*, which invest almost wholly outside the United States. In turn, international funds can (1) diversify across many countries, (2) concentrate in a segment of the world (for example, Europe, South America, the Pacific basin), (3) concentrate in a specific country (for example, the Japan Fund, the Germany Fund, the Italy Fund, or the Korea Fund), or (4) concentrate in types of markets (for example, emerging markets, which would include stocks from countries such as Thailand, Indonesia, India, and China). A mutual fund is a convenient path to global investing, particularly for a small investor, because the purchase or sale of one of these funds is similar to a transaction for a comparable U.S. stock.

A recent innovation in the world of index products are exchange-traded funds (ETFs) that are depository receipts for a portfolio of securities deposited at a financial institution in a unit trust that issues a certificate of ownership for the portfolio of stocks (similar to ADRs discussed earlier). The stocks in a portfolio are those in an index like the S&P 500 or the Russell 3000 and dozens of country or specific industry indexes. As of early 2011, *Barron's* had a sep-

arate listing of "Exchange Traded Portfolios" that contained almost 900 different portfolios to consider (about 70 on NASDAQ and over 820 on NYSE ARCA). A significant advantage is that ETFs can be bought and sold (including short sales) continuously on an exchange like common stock. Although they do not have management fees, they do have expense fees, and there is the typical transaction cost for the purchase or sale of ETF shares.[2]

3.2.4 Special Equity Instruments: Options

In addition to common stock investments, it is also possible to invest in equity-derivative securities, which are securities that have a claim on the common stock of a firm. This would include **options**—rights to buy or sell common stock at a specified price for a stated period of time. The two kinds of option instruments are: (1) warrants and (2) puts and calls.

Warrants As mentioned earlier, a warrant is an option issued by a corporation that gives the holder the right to acquire a firm's common stock from the company at a specified price within a designated time period. The warrant does not constitute ownership of the stock, only the option to buy the stock.

Puts and Calls A **call option** is similar to a warrant because it is an option to buy the common stock of a company within a certain period at a specified price called the *striking price*. A call option differs from a warrant because it is not issued by the company but by another investor who is willing to assume the other side of the transaction. Options also are typically valid for a shorter time period than warrants. Call options are generally valid for less than a year, whereas warrants often extend more than five years. The holder of a **put option** has the right to sell a given stock at a specified price during a designated time period. Puts are useful to investors who expect a stock price to decline during the specified period or to investors who own the stock and want hedge protection from a price decline.

3.2.5 Futures Contracts

Another instrument that provides an alternative to the purchase of an investment is a **futures contract**. This agreement provides for the future exchange of a particular asset at a specified delivery date (usually within nine months) in exchange for a specified payment at the time of delivery. Although the full payment is not made until the delivery date, a good-faith deposit, the **margin**, is made to protect the seller. This is typically about 10 percent of the value of the contract.

The bulk of trading on the commodity exchanges is in futures contracts. The current price of the futures contract is determined by the participants' beliefs about the future for the commodity. For example, in July of a given year, a trader could speculate on the Chicago Board of Trade for wheat in September, December, March, and May of the next year. If the investor expected the price of a commodity to rise, he or she could buy a futures contract on one of the commodity exchanges for later sale. If the investor expected the price to fall, he or she could sell a futures contract on an exchange with the expectation of buying similar contracts later when the price had (hopefully) declined to cover the sale.

Several differences exist between investing in an asset through a futures contract and investing in the asset itself. One is the use of a small good-faith deposit, which increases the volatility of returns. Because an investor puts up only a small portion of the total value of the futures contract (10 to 15 percent), when the price of the commodity changes, the change in the total value of the contract (up or down) is large compared to the amount invested. Another unique aspect is the term of the investment: Although stocks can have infinite maturities, futures contracts typically expire in less than a year.

[2]Mutual funds and ETFs are discussed further in the next section and in Chapters 15 and 25.

Financial Futures In addition to futures contracts on commodities, there also has been the development of futures contracts on financial instruments, such as T-bills, Treasury bonds, and Eurobonds. For example, it is possible to buy or sell a futures contract that promises future delivery of $100,000 of Treasury bonds at a set price and yield. The major exchanges for financial futures are the Chicago Mercantile Exchange (CME) and the Chicago Board of Trade (CBOT).[3] These futures contracts allow individual investors, bond portfolio managers, and corporate financial managers to protect themselves against volatile interest rates. Certain currency futures allow individual investors or portfolio managers to speculate on or to protect against changes in currency exchange rates. Finally, there are futures contracts on various stock market series, such as the S&P (Standard & Poor's) 500, the *Value Line* Index, and the Nikkei Average on the Tokyo Stock Exchange.

3.2.6 Investment Companies

The investment alternatives described so far are individual securities that can be acquired from a government entity, a corporation, or another individual. However, rather than directly buying an individual stock or bond issued by one of these sources, you may choose to acquire these investments indirectly by buying shares in an investment company that owns a *portfolio* of individual stocks, bonds, or a combination of the two. Specifically, an **investment company** sells shares in itself and invests the pooled investor dollars in bonds, stocks, or other investment instruments. The main types of investment companies are mutual funds, closed-end funds, and exchange-traded funds. **Mutual funds** are also referred to as open-ended funds because they issue "redeemable securities" meaning that the fund stands ready to buy or sell the shares at their net asset value with (a load) or without (no-load) a transaction fee. A **closed-end fund** issues a fixed number of shares that trade intraday on stock exchanges at market-determined prices. Investors in a closed-end fund buy or sell shares through a broker just like any publicly traded company. An **exchange traded fund (ETF)** is an investment company, typically a mutual fund whose shares are traded *intraday* on stock exchanges at market-determined prices—in contrast to open-ended funds that are priced only once a day at the market closing prices. Investors may buy or sell ETF shares through a broker just as they would the shares of any publicly traded company.

An investor who acquires shares in an investment company is a partial owner of the investment company's portfolio of stocks or bonds. In the following discussion we will distinguish between investment companies by the types of investment instruments they acquire.

Money Market Funds **Money market funds** are investment companies that acquire high-quality, short-term investments (referred to as *money market* instruments), such as T-bills, high-grade commercial paper (public short-term loans) from various corporations, and large CDs from the major money center banks. The yields on the money market portfolios always surpass those on normal bank CDs because the investment by the money market fund is larger and the fund can commit to longer maturities than the typical individual. In addition, the returns on commercial paper are above the prime rate. The typical minimum initial investment in a money market fund is $1,000, it charges no sales commission, and minimum additions are $250 to $500. You can always withdraw funds from your money market fund without penalty (typically by writing a check on the account), and you receive interest to the day of withdrawal.

Individuals tend to use money market funds as alternatives to bank savings accounts because they are generally quite safe (although they are *not insured*, they typically limit their investments to high-quality, short-term investments), they provide yields above what is available on most savings accounts, and the funds are readily available. Therefore, you might use one of these funds to accumulate funds to pay tuition or for a down payment on a car. Because of

[3]These two exchanges merged in early 2008.

relatively high yields and extreme flexibility and liquidity, the total value of these funds reached almost $4 trillion in 2011.

Bond Funds Bond funds generally invest in various long-term government, corporate, or municipal bonds. They differ by the type and quality of the bonds included in the portfolio as assessed by various rating services. Specifically, the bond funds range from those that invest only in risk-free government bonds and high-grade corporate bonds to those that concentrate in lower-rated corporate or municipal bonds, called **high-yield bonds** or *junk bonds*. The expected yields from various bond funds will differ, with the low-risk government bond funds paying the lowest yields and the high-yield bond funds expected to provide the highest yields.

Common Stock Funds Numerous common stock funds invest to achieve stated investment objectives, which can include aggressive growth, income, precious metal investments, and international stocks. Such funds offer smaller investors the benefits of diversification and professional management. They include different investment styles, such as growth or value, and concentrate in alternative-sized firms, including small-cap, mid-cap, and large-capitalization stocks. To meet the diverse needs of investors, numerous funds have been created that concentrate in one industry or sector of the economy, such as chemicals, electric utilities, health, housing, and technology. These funds are diversified within a sector or an industry, but are not diversified across the total market. Investors who participate in a sector or an industry fund bear more risk than investors in a total market fund because the sector funds will tend to fluctuate more than an aggregate market fund that is diversified across all sectors. Also, international funds that invest outside the United States and global funds that invest in the United States and in other countries offer opportunities for global diversification by individual investors, as documented by Bailey and Lim (1992).

Balanced Funds **Balanced funds** invest in a combination of bonds and stocks of various sorts depending on their stated objectives.

Index Funds Index funds are mutual funds created to equal (track) the performance of a market index like the S&P 500. Such funds appeal to *passive* investors who want to simply experience returns equal to some market index either because they do not want to try to "beat the market" or they believe in efficient markets and do not think it is possible to do better than the market in the long run. Given the popularity of these funds, they have been created to emulate numerous stock indexes including very broad indexes like the Dow Jones Wilshire 5000 and broad foreign indexes like the EAFE index. In addition, numerous nonstock indexes including various bond indexes have been created for those who want passive bond investing.[4]

Exchange-Traded Funds (ETFs) A problem with open-ended mutual funds in general and index funds in particular is that they are only priced daily at the close of the market and all transactions take place at that price. As a result, if you are aware of changes taking place for the aggregate market due to some economic event during the day and want to buy or sell to take advantage of this, you can put in an order for a mutual fund, but it will not be executed until the end of the day at closing prices. In response to this problem, the AMEX in 1993 created an indexed fund tied to the S&P 500—that is, an exchange-traded fund, ETF—that could be traded continuously because the prices for the 500 stocks are updated continuously so it is possible to buy and sell this ETF like a share of stock, as noted previously. As discussed earlier in the section on buying foreign securities, ETFs have been created for numerous foreign and domestic indexes including the Morgan Stanley Capital International (MSCI) indexes. Barclay's Global Investors (BGI) have created "i shares," using the MSCI indexes for numerous individual countries. The performance of these ETFs have been analyzed by Khorana, Nelling, and Trester (1998). As noted earlier, the growth in the number and value of ETFs over the past decade has been substantial.

[4]Stock and bond indexes are discussed in Chapter 5.

3.2.7 Real Estate

Like commodities, most investors view real estate as an interesting and profitable investment alternative but believe that it is only available to a small group of experts with a lot of capital to invest. In reality, some feasible real estate investments require no detailed expertise or large capital commitments. We will begin by considering low-capital alternatives.

Real Estate Investment Trusts (REITS) A **real estate investment trust** is an investment fund designed to invest in various real estate properties. It is similar to a stock or bond mutual fund, except that the money provided by the investors is invested in property and buildings rather than in stocks and bonds. There are several types of REITs.

Construction and development trusts lend the money required by builders during the initial construction of a building. *Mortgage trusts* provide the long-term financing for properties. Specifically, they acquire long-term mortgages on properties once construction is completed. *Equity trusts* own various income-producing properties, such as office buildings, shopping centers, or apartment houses. Therefore, an investor who buys shares in an equity real estate investment trust is buying part of a portfolio of income-producing properties.

REITs have experienced periods of great popularity and significant depression in line with changes in the aggregate economy and the money market. Although they are subject to cyclical risks depending on the economic environment, they offer small investors a way to participate in real estate investments, as described by Hardy (1995), Kuhn (1996), and Myer and Webb (1993).

Direct Real Estate Investment The most common type of direct real estate investment is the purchase of a home, which is the largest investment most people ever make. According to the Federal Home Loan Bank, the average cost of a single family house in early 2011 exceeds $155,000. The purchase of a home is considered an investment because the buyer pays a sum of money either all at once or over a number of years through a mortgage. For most people who are unable to pay cash for a house, the financial commitment includes a down payment (typically 10–20 percent of the purchase price) and specific mortgage payments over a 20- to 30-year period that amortize both the loan's principal and interest due on the outstanding balance. Subsequently, a homeowner hopes to sell the house for its cost plus a gain.

Raw Land Another direct real estate investment is the purchase of raw land with the intention of selling it in the future at a profit. During the time you own the land, you have negative cash flows caused by mortgage payments, property maintenance, and taxes. An obvious risk is the possible difficulty of selling it for an uncertain price. Raw land generally has low liquidity compared to most stocks and bonds. An alternative to buying and selling the raw land is the development of the land.

Land Development Land development can involve buying raw land, dividing it into individual lots, and building houses on it. Alternatively, buying land and building a shopping mall would also be considered land development. This is a feasible form of investment but requires a substantial commitment of capital, time, and expertise. Although the risks can be high because of the commitment of time and capital, the rates of return from a successful housing or commercial development can be significant, as shown in studies by Goetzmann and Ibbotson (1990) and Ross and Zisler (1991). Diversification benefits are documented in Hudson-Wilson and Elbaum (1995).

Rental Property Many investors with an interest in real estate investing acquire apartment buildings or houses with low down payments, with the intention of deriving enough income from the rents to pay the expenses of the structure, including the mortgage payments. For

the first few years following the purchase, the investor generally has no reported income from the building because of tax-deductible expenses, including the interest component of the mortgage payment and depreciation on the structure. Subsequently, rental property provides a cash flow and an opportunity to profit from the sale of the property, as discussed by Harris (1984).

3.2.8 Low-Liquidity Investments

相比之下，本节讨论的投资工具流动性很弱，相较于股票和债券，这些投资工具具有低流动性和高交易成本，因此金融机构通常不会持有。

Most of the investment alternatives we have described thus far are traded on securities markets and except for real estate, have good liquidity. In contrast, the investments we discuss in this section have very poor liquidity and financial institutions do not typically acquire them because of the illiquidity and high transaction costs compared to stocks and bonds. Many of these assets are sold at auctions, causing expected prices to vary substantially. In addition, transaction costs are high because there is generally no national market for these investments, so local dealers must be compensated for the added carrying costs and the cost of searching for buyers or sellers. Therefore, many financial theorists view the following low-liquidity investments more as hobbies than investments, even though studies have indicated that some of these assets have experienced substantial rates of return.

古董的高交易成本和低流动性可能会侵蚀投资者出售古董时所期望赚得的利润。

Antiques The greatest returns from antiques are earned by dealers who acquire them at estate sales or auctions to refurbish and sell at a profit. If we gauge the value of antiques based on prices established at large public auctions, it appears that many serious collectors enjoy substantial rates of return. In contrast, the average investor who owns a few pieces to decorate his or her home finds such returns elusive. The high transaction costs and illiquidity of antiques may erode any profit that the individual may expect to earn when selling these pieces.

Art The entertainment sections of newspapers or the personal finance sections of magazines often carry stories of the results of major art auctions, such as when Van Gogh's *Irises* and *Sunflowers* sold for $59 million and $36 million, respectively.

Obviously, these examples and others indicate that some paintings have increased significantly in value and thereby have generated large rates of return for their owners. However, investing in art typically requires substantial knowledge of art and the art world, a large amount of capital to acquire the work of well-known artists, patience, and an ability to absorb high transaction costs. For investors who enjoy fine art and have the resources, these can be satisfying investments; but, for most small investors, it is difficult to get returns that compensate for the uncertainty, illiquidity, and high transaction costs.

Coins and Stamps Many individuals enjoy collecting coins or stamps as a hobby and as an investment. The market for coins and stamps is fragmented compared to the stock market, but it is more liquid than the market for art and antiques as indicated by the publication of weekly and monthly price lists.[5] An investor can get a widely recognized grading specification on a coin or stamp, and, once graded, a coin or stamp can usually be sold quickly through a dealer, as described by Henriques (1989) and Bradford (1989). Notably, the percentage difference between the bid price the dealer will pay to buy the stamp or coin and the asking or selling price the investor must pay the dealer is going to be substantially larger than the bid-ask spread on stocks and bonds.

值得注意的是，经销商购入邮票或钱币的买价与其出售给投资者的卖价之间的百分比差异远远超过股票和债券的买卖价差。

Diamonds Diamonds can be and have been good investments during many periods. Still, investors who purchase diamonds must realize that (1) diamonds can be highly illiquid, (2) the

[5]A weekly publication for coins is *Coin World*, published by Amos Press, Inc., 911 Vandermark Rd., Sidney, OH 45367. There are several monthly coin magazines, including *Coinage*, published by Miller Magazines, Ventura, CA. Amos Press also publishes several stamp magazines, including *Linn's Stamp News* and *Scott Stamp Monthly*. These magazines provide current prices for coins and stamps.

grading process that determines their quality is quite subjective, (3) most investment-grade gems require substantial capital, and (4) they generate no positive cash flow during the holding period until the stone is sold. In fact, during the holding period, the investor must cover costs of insurance and storage and there are appraisal costs before selling.

In this section, we have briefly described the most common investment alternatives. Following this brief description, we will discuss many of these investment alternatives in more detail when we consider how you evaluate them for investment purposes.

In our final section, we present data on historical rates of return and risk measures, as well as correlations among several of these investments. This provides insights into future expected returns and risk characteristics (both total and systematic risk) for these investment alternatives.

3.3 Historical Risk-Returns on Alternative Investments

How do investors weigh the costs and benefits of owning investments and make decisions to build portfolios that will provide the best risk-return combinations? To help individual or institutional investors answer this question, financial theorists have examined extensive data to provide information on the return and risk characteristics of various investments.

There have been numerous studies of the historical rates of return on common stocks (both large-capitalization stocks in terms of aggregate market value and small-capitalization stocks).[6] In addition, there has been a growing interest in the performance of bonds. Because inflation has been so pervasive, many studies include both nominal and real rates of return on investments. Still other investigators have examined the performance of alternative assets such as real estate, foreign stocks, art, antiques, and commodities. The review of these results should help you to make decisions on building your investment portfolio and on the allocation to the various asset classes.

3.3.1 World Portfolio Performance

A study by Reilly and Wright (2004) examined the performance of numerous assets, not only in the United States, but around the world. Specifically, for the period from 1980 to 2001, they examined the performance of stocks, bonds, cash (the equivalent of U.S. T-bills), real estate, and commodities from the world, United States, Europe, Pacific Basin, Japan, and the emerging markets. They computed annual returns, risk measures, and correlations among the returns for alternative assets. Exhibit 3.8 contains updated geometric and arithmetic average annual rates of return, the standard deviations of returns, and the systematic risk (beta) for a modified set of series for the 31-year period 1980–2010 (the authors deleted and added several series due to availability of the data).

Asset Return and Total Risk The results in Exhibit 3.8 generally confirm the expected relationship between annual rates of return and the total risk (standard deviation) of these securities. The riskier assets with higher standard deviations experienced higher returns. For example, the U.S. stock indexes had relatively high returns (10 to 17 percent) and large standard deviations (15 to 23 percent). It is not a surprise that the highest-risk asset class (without commodities) was the two emerging market stock indexes with standard deviations of 22.98 and 24.92 percent, whereas risk-free U.S. cash equivalents (30-day T-bills) had low returns (4.96 percent) and the smallest standard deviation (0.90 percent).

[6]Small-capitalization stocks were broken out as a separate class of asset because several studies have shown that firms with relatively small capitalization (stock with low market value) have experienced rates of return and risk significantly different from those of stocks in general. Therefore, they were considered a unique asset class. We will discuss these studies in Chapter 6, which deals with the efficient markets hypothesis. The large-company stock returns are based upon the S&P Composite Index of 500 stocks—the S&P 500 (described in Chapter 5).

Exhibit 3.8 Summary Risk-Return Results for Alternative Capital Market Assets: 1980–2010

Index	Arithmetic Mean Annual Return	Geometric Mean Return	Standard Deviation Annual Return (Based on Arithmetic Mean Return)	Beta With S&P 500	Beta With Brinson GSMI
S&P 500	12.04%	10.80%	15.60%	1.00	1.33
Ibbotson Small Cap Index	14.30%	12.18%	20.33%	0.99	1.44
Wilshire 5000 Equal Weighted	19.12%	16.94%	20.83%	1.02	1.48
Wilshire 5000 S&P Cap Weighted	12.02%	10.78%	15.61%	1.00	1.33
Russell 1000	12.06%	10.75%	15.76%	1.01	1.35
Russell 1000 Value	12.50%	11.31%	15.04%	0.92	1.22
Russell 1000 Growth	11.49%	9.81%	17.91%	1.10	1.48
Russell 2000	12.36%	10.35%	19.94%	1.06	1.52
Russell 2000 Value	13.86%	12.31%	17.54%	0.91	1.29
Russell 2000 Growth	10.79%	8.00%	23.44%	1.21	1.75
Russell 3000	12.02%	10.70%	15.89%	1.01	1.37
Russell 3000 Value	12.56%	11.38%	15.04%	0.91	1.23
Russell 3000 Growth	11.35%	9.63%	18.12%	1.11	1.50
IFC Emerging Markets	14.16%	11.57%	22.98%	0.80	1.26
FTSE All World	8.45%	7.09%	15.98%	0.96	1.42
FTSE All World Developed	8.18%	6.83%	15.65%	0.95	1.39
FTSE All World Emerging	10.44%	7.47%	24.92%	1.15	1.83
MSCI EAFE	8.90%	7.26%	17.71%	0.73	1.34
MSCI Europe	12.51%	10.81%	17.80%	0.83	1.39
MSCI Pacifc Basin	10.08%	7.89%	21.13%	0.63	1.26
MSCI Japan	8.59%	6.13%	22.39%	0.54	1.15
Tokyo Stock Exchange Index	4.11%	2.15%	19.51%	0.50	0.88
M-S World Index	11.24%	10.00%	15.37%	0.86	1.34
Brinson GSMI	10.60%	10.01%	10.86%	0.64	1.00
LB Govemrnent Bond	8.30%	8.15%	5.51%	0.04	0.11
LB Corporate Bond	9.07%	8.82%	7.23%	0.14	0.28
LB Aggregate Bond	8.55%	8.39%	5.76%	0.08	0.17
High Yield Corporate Bond	10.43%	10.00%	9.24%	0.33	0.54
ML World Government Bond[1]	8.12%	7.88%	7.04%	0.03	0.18
ML World Government Bond ex U.S.[1]	9.06%	8.58%	9.84%	0.03	0.24
FTSE North American Equity REIT	13.30%	11.62%	17.49%	0.62	0.95
GS Commodities Index[2]	8.38%	6.39%	19.52%	0.18	0.35
Treasury Bill–30-Day	4.96%	4.95%	0.90%	0.00	0.00
Treasury Bill–6 month[3]	5.63%	5.62%	0.98%	0.00	0.00
Treasury Note–2 year[3]	6.80%	6.76%	3.11%	0.01	0.04
Inflation	3.40%	3.39%	1.22%	0.00	–0.01

[1]ML World Government Bond Index based on 1986–2010 only.

[2]GS Commodity Index based on 1983–2010 only.

[3]Treasury Bill–6 month and Treasury Note–2 year based on 1981–2010 only.

Source: Updated and modified, Frank K. Reilly and David J. Wright, "An Analysis of Risk-Adjusted Performance for Global Market Assets," *Journal of Portfolio Management* (Spring 2004).

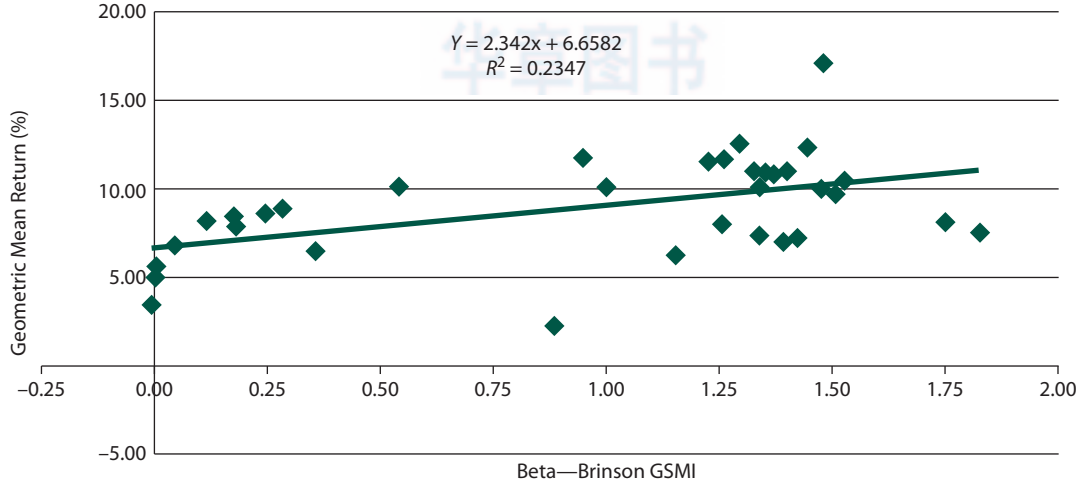
Return and Systematic Risk As shown in Exhibit 3.8, in addition to total risk (standard deviation), the authors also considered systematic risk, which is the volatility of an asset relative to a market portfolio of risky assets (this was discussed briefly in Chapter 1). One of the conclusions of the Reilly and Wright (2004) study was that the systematic risk measure (beta) did a better job

of explaining the returns during the period than the total risk measure (standard deviation). In addition, the systematic risk measure (beta) that used the Brinson Global Security Market Index (GSMI) as a market proxy was somewhat better than the beta that used the S&P 500 Index.[7] Thus, Exhibit 3.9, which contains the scatter plot of geometric mean rate of return and GSMI systematic risk, indicates the expected positive risk–return relationship. The two outliers are the Tokyo Stock Exchange Index on the low side and the Wilshire 5000 equal-weighted index.

Correlations between Asset Returns Exhibit 3.10 contains a correlation matrix of selected U.S. and world assets. The first column shows that U.S. equities (as represented by the broad Wilshire 5000 Index) have a reasonably high correlation with most developed countries but low correlation with emerging market stocks and Pacific Basin stocks. Also, U.S. equities show almost zero correlation with world government bonds, and with the commodities index. Recall from our earlier discussion that you can use this information to build a diversified portfolio by combining those assets with low positive or negative correlations.

The correlation of returns with inflation has implications regarding the ability of an asset class to be an inflation hedge—a good inflation hedge should have a strong positive correlation with inflation. As shown, most assets (including common stocks) have negative correlations with inflation, which implies that they are poor inflation hedges. The exceptions appear to be commodities (0.20) and short-term government bonds (especially 30-day Treasury bills with 0.41 correlation).

Exhibit 3.9 Geometric Mean Return versus Brinson GSMI Beta for Alternative Capital Market Assets: 1980–2010



Source: Updated and modified results from Frank K. Reilly and David J. Wright, "An Analysis of Risk-Adjusted Performance for Global Market Assets," *Journal of Portfolio Management* 30, no. 3 (Spring 2004): 63–77. This copyrighted material is reprinted with permission from *Journal of Portfolio Management,* a publication of Institutional Investor, Inc.

[7]For a detailed analysis of the impact of different market benchmarks, including a detailed comparison of the S&P 500 index versus the Brinson Global Security Market Index (GSMI), see Reilly and Akhtar (1995).

Exhibit 3.10 Correlations among Global Capital Market Asset Monthly Returns: 1980–2010

	Wilshire 5000 Equal Weighted	Wilshire 5000 S&P Cap Weighted	IFC Emerging Markets	MSCI EAFE	M-S World	Brinson GSMI	Inflation
S&P 500	0.763	1.000	0.543	0.645	0.873	0.926	–0.046
Ibbotson Small Cap Index	0.935	0.759	0.533	0.544	0.695	0.771	–0.032
Wilshire 5000 Equal Weighted	1.000	0.763	0.561	0.546	0.702	0.770	–0.014
Wilshire 5000 S&P Cap Weighted	0.763	1.000	0.542	0.645	0.873	0.926	–0.046
Russell 1000	0.786	0.997	0.550	0.645	0.871	0.931	–0.049
Russell 1000 Growth	0.768	0.961	0.526	0.609	0.835	0.898	–0.049
Russell 2000	0.905	0.828	0.540	0.582	0.750	0.829	–0.059
Russell 2000 Value	0.860	0.806	0.511	0.568	0.728	0.801	–0.067
Russell 2000 Growth	0.891	0.807	0.535	0.562	0.731	0.810	–0.049
Russell 3000	0.809	0.993	0.556	0.647	0.871	0.934	–0.051
Russell 3000 Value	0.755	0.949	0.532	0.629	0.836	0.888	–0.047
Russell 3000 Growth	0.791	0.958	0.533	0.613	0.835	0.901	–0.049
IFC Emerging Market	0.561	0.542	1.000	0.569	0.608	0.594	0.004
FTSE All World	0.755	0.943	0.826	0.958	0.998	0.977	0.030
FTSE All World Developed	0.751	0.950	0.801	0.955	0.999	0.976	0.028
FTSE All World Emerging	0.714	0.722	0.985	0.796	0.801	0.804	0.042
MSCI EAFE	0.548	0.645	0.569	1.000	0.929	0.819	–0.072
MSCI Europe	0.595	0.726	0.574	0.884	0.888	0.851	–0.082
MSCI Pacific Basin	0.409	0.462	0.466	0.894	0.780	0.645	–0.020
MSCI Japan	0.329	0.377	0.368	0.835	0.702	0.558	–0.020
Tokyo Stock Exchange Index	0.376	0.399	0.411	0.685	0.622	0.492	0.017
M–S World Index	0.702	0.873	0.608	0.929	1.000	0.945	–0.059
Brinson GSMI	0.770	0.926	0.594	0.819	0.945	1.000	–0.078
LB Government Bond	–0.031	0.112	–0.148	0.072	0.088	0.223	–0.139
LB Corporate Bond	0.209	0.297	0.058	0.242	0.285	0.421	–0.140
LB Aggregate Bond	0.081	0.209	–0.054	0.158	0.189	0.327	–0.123
High Yield Corporate Bond	0.640	0.552	0.404	0.472	0.554	0.633	–0.012
ML World Government Bond[1]	–0.049	0.064	–0.034	0.364	0.255	0.278	–0.107
ML World Government Bond ex U.S.[1]	–0.043	0.041	–0.011	0.431	0.296	0.268	–0.074
FTSE North American Equity REIT	0.598	0.553	0.379	0.461	0.545	0.588	–0.003
GS Commodities Index[2]	0.155	0.145	0.206	0.228	0.212	0.196	0.200
Treasury Bill–30 Day	–0.041	0.027	–0.080	–0.036	–0.014	–0.006	0.411
Treasury Bill–6 Month[3]	–0.022	0.043	–0.078	–0.007	0.013	0.030	0.371
Treasury Note–2 Year[3]	–0.058	0.047	–0.152	0.035	0.037	0.151	–0.021
Inflation	–0.014	–0.046	0.004	–0.072	–0.059	–0.078	1.000

[1]ML World Government Bond Index based on 1986–2010 only.

[2]GS Commodity Index based on 1983–2010 only.

[3]Treasury Bill–6 month and Treasury Note–2 year based on 1981–2010 only.

Source: Updated and modified, Frank K. Reilly and David J. Wright, "An Analysis of Risk Adjusted Performance for Global Market Assets," *Journal of Portfolio Management*, 30, no.3 (Spring 2004): 63–77.

3.3.2 Art and Antiques

Unlike financial securities, where the results of transactions are reported daily, art and antique markets are fragmented and lack any formal transaction reporting system. This makes it difficult to gather data. The best-known series that attempted to provide information about the changing value

of art and antiques were developed by Sotheby's, a major art auction firm. These value indexes covered 13 areas of art and antiques and a weighted aggregate series that combined the 13 areas.

Reilly (1992) examined these series for the period from 1976 to 1991 and computed rates of return, measures of risk, and the correlations among the various art and antique series and compared them to stocks, bonds, and the rate of inflation.

Although there was a wide range of mean returns and risk, a risk-return plot indicated a fairly consistent relationship between risk and return during this 16 year period. Comparing the art and antique results to bond and stock indexes indicated that stocks and bonds experienced results that were very consistent with the art and antique series.

Analysis of the correlations among these assets using annual rates of return revealed several important relationships. First, the correlations among alternative antique and art categories vary substantially from above 0.90 to negative correlations. Second, the correlations between art/antiques and bonds were generally negative. Third, the correlations of art/antiques with stocks were typically small positive values. Finally, the correlation of art and antiques with the rate of inflation indicates that several of the categories were fairly good inflation hedges since they were positively correlated with inflation. Notably, they were clearly superior inflation hedges compared to long-term bonds and common stocks as documented in Fama (1991) and Jaffe and Mandelker (1976). The reader should recall our earlier observation that most art and antiques are quite illiquid and the transaction costs are fairly high compared to financial assets.[8]

3.3.3 Real Estate

艺术品在某种程度上和古董类似，由于交易量有限，且缺乏全国性的交易数据，无法精确计算不动产交易的收益率，所以很难获得不动产的投资收益率。

Somewhat similar to art and antiques, returns on real estate are difficult to derive because of the limited number of transactions and the lack of a national source of data for the transactions that allows one to accurately compute rates of return. In the study by Goetzmann and Ibbotson (1990), the authors gathered data on commercial real estate through REITs and Commingled Real Estate Funds (CREFs) and estimated returns on residential real estate from a series created by Case and Shiller (1987). The summary of the real estate returns compared to various stock, bond, and an inflation series is contained in Exhibit 3.11. As shown, the two commercial real estate series reflected strikingly different results. The CREFs had lower returns and low volatility, while the REIT index had higher returns and risk. Notably, the REIT returns were higher than those of common stocks, but the risk measure for real estate was lower (there was a small difference in the time period). The residential real estate series reflected lower returns and low risk. The longer-term results indicate that all the real estate series experienced lower returns and much lower risk than common stock.

The correlations in Exhibit 3.12 among annual returns for the various asset groups indicate a relatively low positive correlation between commercial real estate and stocks. In contrast, there was negative correlation between stocks and residential and farm real estate. This negative relationship with real estate was also true for 20-year government bonds. Studies by Eichholtz (1996), Mull and Socnen (1997), and Quan and Titman (1997) that considered international commercial real estate and REITs indicated that the returns were correlated with stock prices but they still provided significant diversification benefits.

这些结果表明，不动产的收益率等于或略低于普通股的收益率。但是不动产风险低，并且具有较好的风险分散特性。

These results imply that returns on real estate are equal to or slightly lower than returns on common stocks, but real estate possesses favorable risk and diversification results. Specifically individual real estate assets had much lower standard deviations and either low positive or negative correlations with other asset classes in a portfolio context. Finally, all the real estate series had significant positive correlation with inflation, which implies strong potential as an inflation hedge.

[8]Unfortunately, it has not been possible to update these results because Sotheby's stopped computing and publishing the series in 1992.

Exhibit 3.11 Summary Statistics of Commercial and Residential Real Estate Series Compared to Stocks, Bonds, T-bills, and Inflation

Series	Date	Geometric Mean	Arithmetic Mean	Standard Deviation
Annual Returns 1969–1987				
CREF (Comm.)	1969–87	10.8%	10.9%	2.6%
REIT (Comm.)	1972–87	14.2	15.7	15.4
C&S (Res.)	1970–86	8.5	8.6	3.0
S&P (Stocks)	1969–87	9.2	10.5	18.2
LTG (Bonds)	1969–87	7.7	8.4	13.2
TBILL (Bills)	1969–87	7.6	7.6	1.4
CPI (Infl.)	1969–87	6.4	6.4	1.8
Annual Returns over the Long Term				
I&S (Comm.)	1960–87	8.9%	9.1%	5.0%
CPIHOME (Res.)	1947–86	8.1	8.2	5.2
USDA (Farm)	1947–87	9.6	9.9	8.2
S&P (Stocks)	1947–87	11.4	12.6	16.3
LTG (Bonds)	1947–87	4.2	4.6	9.8
TBILL (Bills)	1947–87	4.9	4.7	3.3
CPI (Infl.)	1947–87	4.5	4.6	3.9

Source: William N. Goetzmann and Roger G. Ibbotson, "The Performance of Real Estate as an Asset Class," *Journal of Applied Corporate Finance* 3, no. 1 (Spring 1990): 65–76. Reprinted with permission.

Exhibit 3.12 Correlations of Annual Real Estate Returns with the Returns on Other Asset Classes

	I&S	CREF	CPI Home	C&S	Farm	S&P	20-Yr. Gvt.	1-Yr. Gvt.	Infl.
I&S	1								
CREF	0.79	1							
CPI Home	0.52	0.12	1						
C&S	0.26	0.16	0.82	1					
Farm	0.06	−0.06	0.51	0.49	1				
S&P	0.16	0.25	−0.13	−0.20	−0.10	1			
20-Yr. Gvt.	−0.04	0.01	−0.22	−0.54	−0.44	0.11	1		
1-Yr. Gvt.	0.53	0.42	0.13	−0.56	−0.32	−0.07	0.48	1	
Infl.	0.70	0.35	0.77	0.56	0.49	−0.02	−0.17	0.26	1

Note: Correlation coefficient for each pair of asset classes uses the maximum number of observations, that is, the minimum length of the two series in the pair.

Source: William N. Goetzmann and Roger G. Ibbotson, "The Performance of Real Estate as an Asset Class," *Journal of Applied Corporate Finance* 3, no. 1 (Spring 1990): 65–76. Reprinted with permission.