

## Introduction to Financial Markets

*Markets are constantly in a state of uncertainty and flux and money is made by discounting the obvious and betting on the unexpected.*

—George Soros

Traditionally, a market is a place where people go to buy or sell things to meet their needs. Financial markets are very similar except that we find stocks, bonds, and other things. A financial market is a market in which financial assets are traded. In addition to enabling exchange of previously issued financial assets, financial markets facilitate borrowing and lending by facilitating the sale by newly issued financial assets. Examples of financial markets include the New York Stock Exchange (resale of previously issued stock shares), the U.S. government bond market (resale of previously issued bonds), and the U.S. Treasury bills auction (sales of newly issued T-bills). A *financial institution* is an institution whose primary source of profits is through financial asset transactions. Examples of such financial institutions include discount brokers, banks, insurance companies, and complex multifunction financial institutions.

Traditionally, financial markets serve six basic functions. These functions are briefly listed below:

- *Borrowing and Lending.* Financial markets permit the transfer of funds (purchasing power) from one agent to another for either investment or consumption purposes. Borrowers can be either government or companies. Borrowers are driven by costs when accessing financial markets where Investors (institutional or non-institutional investors) are looking for return and profit. Financial markets bring them together.
- *Price Determination.* Financial markets provide vehicles by which prices are set both for newly issued financial assets and for the existing stock of financial assets. An asset is any item of value that can be owned. A financial instrument is an asset that represents a legal agreement. There are numerous

financial instruments—for example, stocks, bonds, T-bills, personal loans, futures, forwards, options, swaps, and so on. An asset class is a group/classification of financial instruments that share similar characteristics—for example, equity-based assets, debt-based assets, and cash-based assets (money market, etc.).

- *Information Aggregation and Coordination.* Financial markets act as collectors and aggregators of information about financial asset values and the flow of funds from lenders to borrowers.
- *Risk Sharing.* Financial markets allow a transfer of risk from those who undertake investments to those who provide funds for those investments.
- *Liquidity.* Financial markets provide the holders of financial assets with a chance to resell or liquidate these assets.
- *Efficiency.* Financial markets reduce transaction costs and information costs.

In attempting to characterize the way financial markets operate, one must consider both the various types of financial institutions that participate in such markets and the various ways in which these markets are structured (Figure 1.1). Thus, a financial market is a marketplace in which financial instruments are traded.

There are four admitted primary financial markets, but we will see that there are also other important markets:

- The stock (equities) market
- The bond (fixed-interest) market

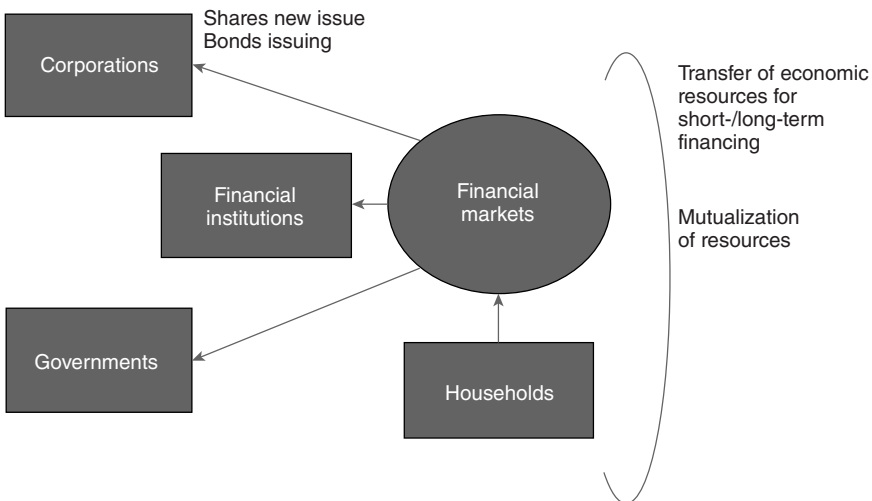


FIGURE 1.1 The financial markets.

- The derivatives market (futures, options, etc.)
- The foreign exchange market

Many companies either occasionally or regularly must raise money for either (a) operations purposes such as covering payroll, adjusting inventory level, or managing any other operating expenses or (b) expansion purposes such as purchasing real estate (land, buildings, factories, etc.), purchasing equipment (e.g., an airline company wants to buy some additional aircrafts), purchasing raw materials, or hiring new employees. How can companies raise money?

In the area of debt financing, a company may borrow some money from an outside source with the promise to repay the principal and interest. Thus they can borrow money either from a bank or from issue such as bonds, bills, or notes. Borrowing money is not necessarily a bad decision, because debt is also a form of leverage and is a common and often cost-effective method of raising money. Corporate balance sheets of all companies, even the healthiest ones, include some level of debt. Another form of corporate financing is equity financing. A company sells a portion of itself to an outside source. Actually, it is selling shares of the company. A share is a unit of ownership in a company. The company decides how many shares to authorize when it incorporates. Usually, some of the authorized shares are issued to the founders, and some shares are retained by the corporation.

Here is an easy example to understand:

**Example.** Let's imagine that a new corporation is formed. This corporation authorizes 2,000,000 shares of stock. If the total combined value of the corporation's asset is \$200,000, then how much is each share of the company worth? This is not complex to calculate, and the following formula answers that question.

$$\text{Company}_{\text{share value}} = \frac{200,000}{2,000,000 \text{ shares}} = \$0.10 \text{ per share}$$

Each of these markets is highly regulated (even if for some individuals they are never enough!). Regulation of the U.S. financial markets is the responsibility of the U.S. Securities and Exchange Commission, the SEC.<sup>1</sup>

The SEC was formed during the Great Depression after the stock market crash of 1929. It has been created by the Securities Exchange Act of 1934. It is headquartered in Washington, D.C. and currently employs approximately 4000 people. The original purpose of the SEC is to regulate the stock market and prevent corporate abuses relating to the reporting and sale of securities. Trust is the backbone for all financial markets. The SEC was given the power to license and regulate stock exchanges, companies that issue stock, stockbrokers, and dealers.

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<sup>1</sup><http://www.sec.gov/>

Currently, the SEC is in charge of overseeing eight major laws that govern the securities industry:

- Securities Act of 1933
- Securities Exchange Act of 1934
- Trust Indenture Act of 1939
- Investment Company Act of 1940
- Investment Advisers Act of 1940
- Sarbanes–Oxley Act of 2002
- Credit Rating Agency Reform Act of 2006
- Dodd–Frank Wall Street Reform and Consumer Protection Act of 2010 as a result of the credit and financial crisis<sup>2</sup>

The SEC can bring civil enforcement actions against individuals or companies who are alleged to have committed fraud, engaged in insider trading, or violated any other securities law.

In Europe this task is spread among national regulators and a pan-European authority called ESMA.<sup>3</sup>

## 1.1 The Money Market

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The term *money market* refers to the network of corporations, financial institutions, professional investors, and governments that deal with the flow of short-term capital. The money market is for transactions up to one year. It is an over-the-counter market. When a professional requires cash for a short period, when a bank wishes to invest money for a while, when a government needs to meet its payroll, and so forth, a short-term liquidity transaction occurs in the money market.

The money markets have expanded significantly in recent years because of the general outflows of money from the banking industry, a process referred to as *disintermediation*. Financial deregulation has caused banks to lose market share in both deposit gathering and lending. Consequently, market forces rather than regulators determine interest rates. However, it has to be noted that central bank's intervention in short-term rates may have their undoubted impact on the markets.

There are numerous types of short-term instruments apart from plain deposits and loans.

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<sup>2</sup>There are many pieces to it, and some are overseen by the Fed, Treasury, FSOC, FinCen, the SEC, and the CFTC. However, the parts most well known (and applicable to asset management) relate to the pieces under the authority of the SEC and CFTC.

<sup>3</sup><http://www.esma.europa.eu/>

**Deposits and Loans.** For deposits and loans, quotes are given with bid<sup>4</sup> and offer rates—for example, 3.25–3.35 for a given period, which means that the bank is inviting you to place money at 3.25 less its margin and will allow you to borrow at 3.35 plus its margin.

Periods are standard, and the computation of interest is done on an exact day count basis. The computation of interest is done in the eurozone on a basis of 360 days.

**Commercial Paper.** It is a short-term debt obligation of a private-sector company or government-sponsored corporation. In most cases, the paper has a lifetime between 3 and 9 months.

**Bankers' Acceptances.** A promissory note is issued by a nonfinancial company to a bank in return for a loan. The bank resells the note in the money market at a discount and guarantees payment. Acceptances usually have a maturity of less than six months.

**Treasury Bills (T-Bills).** These are securities with a maturity of one year or less, issued by national governments. Treasury bills issued by an AAA country are generally considered the safest of all possible investment until now. Those securities account for a larger share of the money market trading than any other type of instrument.

**Certificate of Deposit (CD).** CDs are negotiable interest-bearing deposits that cannot be withdrawn without penalty before a specific date.

**Repurchase Agreements (Repos).** Repos play a critical role in the money markets. A repo is a combination of two transactions. In the first transaction, a security dealer sells securities it owns to an investor, agreeing to repurchase the securities at a specified higher price at a future date. In the second transaction, days or months later, the repo is unwound as the dealer buys back the securities from the investor. The amount the investor lends is less than the market value of the securities in order to ensure that there is sufficient collateral if the value of the securities should fall before the dealer repurchases them. For the investor the repo offers a profitable short-term use for unneeded cash.

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## 1.2 The Capital Market

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The capital market comprises transactions beyond one year.

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<sup>4</sup>The bid rate is the rate a bank is willing to pay to attract a deposit from another bank.

### 1.2.1 THE BOND MARKET

The predominant instrument for raising long-term capital is bond. A bond is an interest-bearing security mainly issued by governmental entities or large companies. An alternative to issuing shares or taking out a bank loan, bonds are a further way to raise capital. A bond is issued in the primary market. The bond market is a part of the capital market. It is divided in two different types known as the primary bond market and the secondary bond market. The primary bond market is also referred to as debt market, credit market, and fixed income market.

In the primary bond market, the companies or the government will offer the new bonds and the fund generated through the process will go to the issuer of the bond. The total size of the global bond market is about \$100 trillion. The United States shares a major portion of the global bond market revenue.

There is a certain process of offering these bonds for the first time in the primary bond market. The process of offering bonds to the public is similar to the offering of the stock. For the purpose of offering bonds in the primary market, a company or a firm needs the assistance of an investment bank. The investment bank provides all the necessary experience and expertise for the purpose. The investment bank provides its suggestions regarding the creation of the issue.

At the same time, the bank also provides an estimate of the expected yield from the issue. The maturity period of the bond is also suggested by these banks. The bank also helps in selling the bonds in the primary bond market. At the same time, the bank may also purchase the whole issue through firm commitment underwriting.

For the marketing of the new issue in the primary bond market, the investment bank uses its own network. The bank forms a syndicate—or, at certain times, forms a selling group—to sell the bonds to the investors through the primary bond market. The institutional investors or the individual investors lend their money to the particular company through these bonds. Once these are purchased from the primary bond market, these can be further traded in the secondary bond market.

These bonds provide a fixed income source to the investor. At the same time, the offering companies or the government will also get the very necessary money for their projects.

The bond generates a series of periodic interest payments, called coupons. A bond's yield is the interest rate (or coupon) paid on the bond, divided by the bond's market price. Bonds may be issued for a period of up to 30 years, as in the United States. A bond is considered to be a long-term bond if it is issued for a period of over 10 years. Years ago, Great Britain issued perpetual bonds—that is, without final maturity.

The capital market is subject to the same laws of perception, demand, offer, and choices as the money market, even more so because of the time element. The clearest illustration of this is in long-term bonds, whose value decreases substantially with increasing inflation—that is, increasing interest rates. Bear in mind that there is a correlation between interest rates and inflation rates.

As an instrument, bonds come in all sorts of versions. The capital market is a sophisticated market in which to raise long-term money. Both governments and corporations have tapped the market significantly, to the tune of trillions of euros. Imagination, in the field of issuance of types of bonds, is only limited by the mathematics.

Few of the millions of daily capital-market transactions involve the issuer of the security. Most trades are in the secondary markets, between investors who have bought the securities and other investors who want to buy them—in contrast to money markets, where short-term capital is raised or for pure speculation purposes.

Bonds are generally regarded as a lower risk investment. Government bonds, in particular, are highly unlikely to miss their promised payments. Corporate bonds issued by the blue chip “investment grade” companies are also unlikely to default; this might not be the case with high-yield “junk” bonds issued by firms with less healthy financials.

How are bond prices usually determined?

Assume that you are the holder of a bond but wish to sell it; you would certainly like to obtain as high a price as possible whereas the purchaser would like to pay as little as possible. How then are prices fixed? The easy answer at this stage would be *by demand and offer*. However, there is an additional concept: the present value concept. It is a key concept in finance. Let us take some time to have a look at it without developing too much on this, considering that this concept has already been largely explained in many manuals and books dealing with basic in finance and investing.

**1.2.1.1 The Present Value Concept.** Let us assume that you are purchasing a 10-year bond. You are only going to do this if you recover your 100 units plus something more called a coupon (profit). Let us assume that you get 5 units per annum out of this investment. That would mean that during the period of 10 years ahead, you get 10 times 5 units, plus, at the end of the ten years, you get your money back.

However, is the last payment of 5 units worth as much as the first payment of 5 units? Will the last 5 units allow you to purchase the same amount of goods as the first five units? Those 5 units have a different purchasing power. What will be the purchasing power of the 100 units you get back 10 years from now? The difference in purchasing power is due to inflation, which generally erodes the purchasing power of money. Money loses its value in an impressive way. Charlie Chaplin’s film *Modern Times* in 1936 was considered expensive, with a cost of USD 1,500,000, whereas James Cameron’s *Titanic* cost USD 1,000,000 per minute!

Let us then summarize this: In an inflationary environment, the present value of 5 units to be received in one year is smaller than 5 units now. In that type of environment a monetary unit of today is worth more than a monetary unit of tomorrow. A monetary unit of today can be invested and start producing income immediately. The level of income will be linked to the level of inflation. This is one of the basic principles of finance.

**Example.** Suppose that we place 100,000 for one year at 5% a year.

We all know that we will have 105,000 at the end of the year.

The PV (present value) is 100,000 and the FV (future value) in this case is 105,000.

Put this into an equation:

$$105,000 = 100,000 + 5\% \text{ of } 100,000$$

or

$$105,000 = 100,000 + 100,000 * 0.05$$

or, by isolating 100,000,

$$105,000 = 100,000(1 + 0.05)$$

$$105,000 = 100,000(1.05)$$

Here 105,000 represents the future value of 100,000 with an interest rate of 5% during one year.

What is the simple interest rate formula? The discount formula is derived from the above formula by dividing both parts of the equation by  $(1 + 0.05)$ .

Let us now pose the following question:

What is the present value of 105,000, which will be paid out to us in a year's time, assuming a 5% interest (discount) rate?

Computing is easy. By employing the reverse interest formula—that is, the discount formula—we have

$$105,000 * \frac{1}{1 + 0.05} \quad \text{or} \quad 105,000 * \frac{1}{1.05} = 100,000$$

Assuming now that we place the same amount at the same interest rate for one more year (i.e., for two years), determine the future value?

For the first year, one calculates this as follows using simple interest rate computation:

$$100,000 * 1.05 = 105,000$$

For the second year, one calculates this as follows:

$$105,000 * (1.05) = 110,250$$

By replacing 105,000 by  $100,000 (1.05)$ , one gets  $100,000 * (1.05) * (1.05)$ —that is,

$$100,000 * (1.05)^2 = 110,250$$



For an investment with a compounded interest rate, it is sufficient to take the initial amount being invested and then multiply it by the given interest rate raised to the power which represents the number of years during which the amount is placed.

The future value of 100,000 bearing interest at 5% during 2 years is 110,250. The present value of 110,250, which we will receive in 2 years' time, with a discount rate of 5% is 100,000; the formula is  $110,250 \times 1/(1 + 0.05)^2$ .

Thus, the present value of a delayed payoff may be found by multiplying the payoff by a discount factor. If  $C_1$  denotes the expected payoff at a period 1 (one year hence), then the present value is

$$\text{Present value (PV)} = C_1 \times \text{Discount factor}$$

Let us see how the simple concepts of present and future value are useful with regard to our understanding of bonds.

Assuming that an investor has a 3-year bond with a value of 100,000 (called the face value), providing us with 10,000 a year, our successive cash flows would be

10,000 at the end of the first year

10,000 at the end of the second year

10,000 at the end of the third year + the initial capital of 100,000 = 110,000

We know that 10,000 in 1 year's time will not have the same value as 10,000 today, and even less so 3 years from now. If we do not want to compare unequal elements, it is absolutely necessary to put all these amounts on the same basis—that is, the present value (PV). Once we have done that, all these amounts can be added as they have been put on the same basis. It is thus necessary to discount these amounts to obtain their present value.

The discount rate should at least represent the inflation rate, or rather our perception of the inflation rate during the lifetime of the bond. Let us say, in this case, that it is 7%.

The future cash flows discounted at 7% are as follows:

$$\text{PV}(C_1): 10,000 \times 1/1.07 = 9,346$$

$$\text{PV}(C_2): 10,000 \times 1/1.07^2 = 8,734$$

$$\text{PV}(C_3): (10,000 + 100,000) \times 1/1.07^3 = 89,793$$

Therefore, the total present value is:

$$9346 + 8730 + 89,760 = 107,836$$

which is definitely less than 130,000. This bond will be quoted at 107.83% of the par value—that is, its price at the issuance.

$$\frac{10,000}{1.07} + \frac{10,000}{(1.07)^2} + \frac{10,000}{(1.07)^3} + \frac{100,000}{(1.07)^3}$$

As a result of this way of computing bond prices, one will notice the following characteristics of bonds:

An increase in the interest rates (and/or inflation) will result in decreasing bond prices. Long-term bonds are more sensitive to interest rate fluctuations than short-term bonds. Bonds with high-interest-bearing coupons are less sensitive than bonds with low-interest-bearing coupons.

**1.2.1.2 Types of Bonds.** Since the beginning of the 1980s, so many new versions of bonds have been issued—even more so than shares—which makes it virtually almost impossible to draw up an exhaustive list. Some versions are much more widespread than others.

*Fixed Rate Bonds.* The traditional fixed-rate bonds can be divided into two types of bonds dependent upon the selected amortization formula. The simplest structure is the entire amortization at the end of the lifetime of the obligation. It is the simplest structure and easiest to manage for the issuer. However, it is usually not in line with the cash flow of the issuer. Certain issuers prefer an amortization by constant annual installments. Each payment includes interest due and the repayment of a fraction of the principal. Bonds are reimbursed as they are selected on the basis of a lottery. This represents a definite risk for the bearer. A similar method consists of amortization per equal series. Each year the same quantity of bonds is being repaid.

*Variable Maturity Bonds.* The simplest version of a bond with a variable maturity is a bond with an extendable maturity. The bearers may require the extension of the maturity date to a later date when the original maturity date has been reached.

*Bonds with a Subscription Certificate.* Bonds with a subscription certificate are bonds to which a subscription right is attached as of the issuance of the loan. This right constitutes in itself a transferable security and is quoted separately. This right gives to its holder the right to subscribe, at a predetermined date and at a predetermined price, to a new issue of bonds or shares.

*Zero Coupon Bonds.* This type of bond only generates two flows of funds, one at the issuance and one at the maturity when principal and interest are repaid in one single transaction. The bonds with a zero coupon offer the advantage that the risk related to the reinvestment of the coupons has been eliminated. The subscriber knows, as of the issuance, what the exact actualized yield will be.

Therefore, the rate of interest is lower than that of a traditional bond issued at the same time. The issuer benefits from the fact that interest can be carried forward until the maturity date.

*Bonds with Variable or Revisable Rates.* The interest rate risk incurred, throughout the lifetime of the bond, by the issuer (if the interest rate drops) and by the investor (if the interest rate rises) has been partially neutralized by the introduction of a clause allowing for a periodical adjustment of the interest rate. Obviously, one observes, in that case, a commonly agreed-upon reference date. Thus, some bonds have a market interest rate as reference, like the “London inter-bank offered rate” (LIBOR) or the rate for other bonds such as the 10-year U.S. government bond.

*Indexed Linked Bonds.* The principal is repayable as a function of a well-specified reference, unlike the bonds with variable or revisable interest rates. This is a bond in which payment of income on the principal is related to a specific price index—often the Consumer Price Index. This feature provides protection to investors by shielding them from changes in the underlying index. The bond’s cash flows are adjusted to ensure that the holder of the bond receives a known real rate of return.

This type of bond is valuable to investors because the real value of the bond is known from purchase and the risk involved with uncertainty is eliminated. These bonds are also less volatile than nominal bonds and they help investors to maintain their purchasing power. For example, assume that you purchase a regular bond with a nominal return of 4%. If inflation is 3%, you will actually only receive 1% in real terms. On the other hand, if you buy an index-linked bond, your cash flow will be adjusted to changes in inflation and you will still receive the full 4% in returns.

*Convertible Bonds.* The convertible bond offers the bearer, during a predetermined period and at his request, the opportunity to convert the bond into a previously agreed-upon, number of shares of the issuer. The conversion right is not quoted separately but is included in the price of the bond. The bearer pays for this privilege by accepting a lower rate of return for the bond. Convertible bonds combine the features of bonds and stocks in one instrument. It is a bond that gives the holder the right to “convert” or exchange the par amount of the bond for common shares of the issuer at some fixed ratio during a particular period. As bonds, they have some characteristics of fixed-income securities. Their conversion feature also gives them features of equity securities.

A convertible bond is a security, typically ranging between 25 and 30 years in term, that gives its’ owner the right to acquire the issuers common stock directly from the issuer rather than purchasing it in the open market. The terms under which this exchange can occur are detailed out in the bond indenture. The optionality component of this security, which allows for the bond holder to convert debt into equity, results in the bond holder receiving lower yields as compared to nonconvertible securities.

Typically, convertible bonds will be classified as subordinated debt and therefore more risky than unsubordinated debt. Subordinated debt holders are lower on the totem pole as far as principal repayment during times of distress for the issuer. In the event of bankruptcy, “senior” bond holders will be paid their credit balance before subordinated debt holders.

***Convertible Bond Structure.*** A convertible bond has a few key additional features in structure as compared to a typical bond:

*Conversion Price.* Price paid per share to acquire the common stock of the issuer

*Conversion Ratio.* This ratio determines the number of shares the bond holder will receive per bond they exchange. The formula for the conversion ratio is: par value of convertible security divided by conversion price.

*Parity.* Conversion parity is the point at which a profit, or loss, would be made at conversion. Basically, parity exists when the conversion ratio at issuance is equal to the convertible security price divided by the market value of the stock. When the price of the stock increases above the conversion parity price, the convertible security would be subject to price changes relative to the movements of the stock. When this condition exists, stock price appreciation will be reflected in the price of the bond which will allow the bond holder to sell the convertible security for a profit rather than performing a conversion and then selling the stock for a gain.

*Conversion Premium.* The conversion premium measures the spread between the conversion price and the current market value in percent. For example, if a stock is currently trading at \$50 per share and the bond conversion price is \$60, the bond would be said to be trading with a 20% conversion premium.

***Advantages and Disadvantages to Issuers.*** Convertible securities tend to be offered by issuers as a means to achieve lower fixed costs for borrowing. Issuers save an average of 2% on the yield that they give their convertible bond holders. For a start-up firm, this is especially helpful; rather than issuing common stock at a 15% to 20% discount to market value on IPO, firms can issue convertible securities which offer lower upfront yields to their borrowers and a conversion premium of 20% to 30% above market value at that time.

Secondly, through the issuance of convertible debt, issuers avoid dilution of their common shares and, therefore, higher stock prices for their shareholders. The analysis would need to be done for the issuer to understand if the interest expense of the convertible debt issuance would be less than the cost of diluting the common stock. For start-up companies with lower revenues, this is most likely the case.

Issuers may even add their own call protection feature into the bond, allowing them to call the bond back in the case that the company starts to increase

their earnings, thereby increasing the stock and the price of the bond. The call feature would allow the issuer to force the bond holder to convert their bonds at a lower price.

For example, suppose the indenture stated that the convertible bond could be exchanged for 10 shares of common stock and also assume that the issuer built in a call provision that would allow them to call the bond away at a bond price of 110. When the bond was issued, the stock was trading at \$100/share. After a few years of rapid growth, the earnings per share increased dramatically and propelled the stock much higher to \$120 per share, which also moved the bond price to 120. In this scenario, the issuer would be able to make the bond holder sell the bond back at 110, or \$1100 per bond. The value of the conversion is now \$1200. Remember, the issuer uses convertibles rather than equity in order to avoid equity dilution, which lowers stock price. In this case, the issuer has borrowed funds at a lowered rate, avoided equity dilution, and forced the bond holder to sell the bond at a discount to market. If equity needs to be raised, it can now be done at a higher price.

One key disadvantage to the issuer of a convertible exists if the stock price increases so rapidly that the conversion takes place in a relatively short amount of time. This indicates that the company did not do a good job of valuing themselves; however, it is a win-win for both parties nonetheless. A second, more negative scenario exists when the common stock actually moves lower after issuance. In this case, the bond holder will not convert to equity as the issuer had hoped.

***Advantages and Disadvantages to Convertible Investors.*** Convertible bonds are a safer investment than buying common stock but can provide the stock-like returns. They are less volatile than stocks, and their value can only fall to a price where the yield would be equal to that of a nonconvertible bond of the same terms. They offer strong downside protection in a bear market, but also allow the investor to take part in the profits as a stock moves higher.

Convertibles can be disadvantageous in the sense that the bond holder will be receiving substantially lower yield to maturity in comparison to the nonconvertible equivalent. This is only a concern when the issuer's equity does not achieve the upward price projections that would make taking the lower yield speculation worthwhile.

Additionally, the ability for speculation is greatly reduced when a call provision is attached to the convertible bond. This limits the upside and will force the bond holder to give up their bond at a discount to market.

Convertible bonds provide the investor with a vehicle that has lower risk and lower yields, yet allow the investor to take advantage of a higher stock price. Upfront research should be done, however, to understand if the security will work for you. Remember, a convertible sells at a premium to the value of the stock. The bond holder is making a tradeoff: lower yields upfront for anticipated gains in the stock price. If those gains are not achieved, the bond holder will have given up the yield spread between the convertible and nonconvertible security.

Total market size:	\$185.6B
Average market yield:	3.66%
Average conversion premium:	52.23%

**FIGURE 1.2** The convertibles market in 2012. **Source:** Bank of America Merrill Lynch as of 12/31/11.

**Today's Convertibles Market.** The convertibles market provides access to capital for a wide variety of companies. Convertibles have become particularly beneficial to small and midsize companies whose low credit ratings, limited earnings history, or small market cap may limit their ability to access the straight equity or debt markets at levels attractive to them. The market also has become increasingly attractive to investment-grade companies, given the relatively low cost of capital associated with issuing convertibles and the diversification of funding sources that convertibles provide.

The overall market for convertibles today is balanced in terms of supply and demand (Figure 1.2), with the makeup of issuers changing dramatically over time. Demand is both strong and broad-based, as dedicated convertible investors and crossover fixed-income and equity investors have replaced speculative hedge funds as the dominant market participants. At the start of 2012, convertibles were cheap relative to their theoretical value, and they continued to offer downside protection along with the potential to participate in a market rally.

**Advantages for Investors.** Convertible securities offer four main advantages to investors:

1. For many investors, managing portfolio risk means limiting volatility. Convertible securities offer a unique way to accomplish this. In a falling stock market, the debt portion of the convertible typically cushions the effects of a market decline, often allowing convertibles to outperform equities. In a rising stock market, convertibles also can provide the opportunity for capital growth, albeit to a lesser degree than common stock. In volatile markets, such as the one experienced in 2007 and 2008, the underlying call options embedded in convertible securities tend to rise in value, adding to the price of convertible securities.
2. It is important to point out that although convertible investors do not typically participate in 100% of the movements in the underlying stock, historically they have generally participated in a greater proportion of upward movements than downward movements (absent meaningful credit deterioration) because of the downside protection provided by the instrument's bond component. Adding convertible securities to an all-equity portfolio reduced portfolio standard deviation over the past 10 years. Furthermore, while most convertibles can be exchanged for shares of common stock, there is most often no obligation to do so.

3. Convertibles generally represent a lower level of principal risk than common stock, since convertibles are more senior in the capital structure. In the event of corporate bankruptcy, convertible holders are repaid ahead of common shareholders. That said, there are times when convertibles tend to underperform. Specifically, during downturns in the credit cycle, convertibles tend to lag behind the broader equity market due to a higher proportion of lower-credit-quality issuers in the convertibles market. Convertibles also tend to underperform in certain equity bull markets, where performance is driven by a narrow range of stocks.
4. Also, convertible bonds are usually less volatile than regular shares. Indeed, a convertible bond behaves like a call option. Therefore, if  $C$  is the call price and  $S$  is the regular share, then

$$\Delta = \frac{\delta C}{\delta S} \Rightarrow \delta C = \Delta \cdot \delta S$$

Consequently, since  $0 < \Delta < 1$  we get  $\delta C < \delta S$ , which implies that the variation of  $C$  is less than the variation of  $S$ , which can be interpreted as less volatility.

*Special Bonds.* Up to this point we have been describing ordinary bonds, technically called “straight bonds.” There are other types of bonds with special characteristics:

- Bonds with a call option give the issuer the possibility to redeem the bonds prior to the maturity date.
- Bonds with a put option give the holder the possibility to ask for redemption of the bond before the due date, either at a previously agreed-upon price or at par.

*Junk Bonds.* These bonds are below the threshold commonly considered as a “good investment” and contain consequently speculative components. Their return will thus be higher than bonds with a comparable maturity. The key issue here is the level of risk. However, experience has shown that, with some exceptions, the rate of nonpayment is not alarmingly high for these kinds of instruments. These instruments may sometimes offer quite attractive opportunities.

The global default rate for speculative-grade debt increased 0.1 percentage point during the third quarter to 3 percent in September 2012, the highest level in almost two years, according to Moody’s Investors Service. The ratings company’s trailing 12-month global speculative-grade default rate increased from 2.9 percent in the second quarter and compares with 1.8 percent a year ago, according to Moody’s. The rate remains less than a historical average of 4.8 percent in data going back to 1983 and is the highest since 3.2 percent in December 2010.

U.S. junk-rated defaults increased to 3.5 percent in September 2012 from a 3.2 percent rate in the second quarter. In Europe, the pace of high-yield defaults

fell to 2.6 percent last month from 2.8 percent in the second quarter, still according to a Moody's statement.

## 1.2.2 THE STOCK MARKET

A share is a representative fraction of the net worth of a corporation. A share may generate a dividend. The subscription or the purchase of a share implies a participation in the profits generated by the company but also the acceptance of risk sharing. However, the nature and legal status of a limited company limits the risks taken by the shareholders to the amount invested in the company.

A shareholder is entitled to a number of rights, one of which is a right to a fraction of the distributed profits, called dividends, each year following the approval by the (ordinary) general meeting—the annual meeting of the shareholders—upon the recommendation of the board. The dividends are not automatic and depend on the good fortune of the business—in other words, on a positive cash flow.

Other shareholder rights include:

- A preferential right of subscription for all new share issues
- A voting right at the ordinary and extraordinary general meetings
- A right to check on the management and the accounts
- A right of participation in the liquidation of the company in the event of sale or a dissolution

There are various ways of issuing shares on the market:

- *Via a Prospectus*: This is the most popular way to privatize state-owned entities; this method is widely used.
- *Via a Public Offer*: Everyone is invited to buy shares. In other words, everyone is free to make an offer beyond a fixed minimum price.
- *Via Private Placements*: This method is followed mainly for small and medium-sized companies that want to raise new capital. In view thereof, the shares are placed with brokers or institutional investors and are accessible to the public only on the secondary market.
- *Via Registration Fees*: This method of raising capital implies that only the existing shareholders can subscribe at a preferential rate, in proportion to the number of shares they already hold. The great advantage of this formula is that the percentage of the shareholding is not amended.

Being quoted on the stock exchange constitutes a cumbersome and expensive operation. However, it enables a company to increase its equity in order to finance its expansion. It is a convenient way to finance expansion when the original shareholders do not wish to put fresh money on the table or if they do not mind seeing their shareholding being diluted. Figure 1.3 and Figure 1.4 give an overview of the main domestic equity market capitalization performances and the largest domestic equity market capitalization in the world.



Region	USD bn			% Change, end Dec. 2011 (in USD)	% Change, end-June 2011 (in USD)
	End June 2012	End Dec 2011	End June 2011		
Americas	21,361	19,587	22,582	9.1%	-5.4%
Asia Pacific	15,396	14,670	17,384	4.6%	-11.8%
Europe Africa Middle East	12,978	12,942	16,305	0.3%	-20.4%

**FIGURE 1.3** Regional and total WFE domestic equity market capitalization performances. *Source:* World Federation of Exchanges, Market Highlights for First Half-Year 2012.

	Exchanges	USD bn			% Change, end Dec. 2011 (in USD)	% Change, end-June 2011 (in USD)
		End June 2012	End Dec 2011	End June 2011		
1	NYSE Euronext (U.S.)	13,028	11,795	13,791	10.5%	-5.5%
2	NASDAQ OMX (U.S.)	4,475	3,845	4,068	16.4%	10.0%
3	Tokyo Stock Exchange Group	3,385	3,325	3,655	1.8%	-7.4%
4	London Stock Exchange Group	3,332	3,266	3,849	2.0%	-13.4%
5	NYSE Euronext (Europe)	2,460	2,447	3,248	0.5%	-24.3%
6	Shanghai Stock Exchange	2,411	2,357	2,804	2.3%	-14.0%
7	Hong Kong Stock Exchange	2,376	2,258	2,712	5.2%	-12.4%
8	TMX Group	1,860	1,912	2,231	-2.7%	-16.6%
9	Deutsche Borse	1,212	1,185	1,622	2.3%	-25.3%
10	Shenzhen Stock exchange	1,149	1,055	1,283	8.9%	-10.4%

**FIGURE 1.4** Ten largest domestic equity market capitalization at mid-year 2012. *Source:* World Federation of Exchanges.

In order to be considered a company acceptable for quotation on the stock market, a considerable number of formal requirements must be met.

The stock market is divided in two different markets known as the primary equity market and the secondary equity market. The primary equity market is used for offering new equity issues in the market. This market provides the companies the source of generating funds for the business purpose. It is also interesting to look at the concentration level in the main equity markets as the dispersion between the top 10 companies can be very large. It is particularly important to be aware of the concentration level when analyzing any equity market (see Figure 1.5).

Exchange	2011		2010	
	Market cap. of top 10 companies	Turnover value of Top 10 companies	Market cap. of Top 10 companies	Turnover value of Top 10 companies
<b>Americas</b>				
Bermuda SE	97.8%	NA	84.6%	NA
BM&FBOVESPA	53.1%	47.7%	55.4%	50.3%
Buenos Aires SE	70.1%	71.1%	69.9%	70.2%
Colombia SE	79.1%	68.7%	79.3%	86.6%
Lima SE	61.6%	64.2%	64.3%	68.6%
Mexican Exchange	65.9%	62.1%	66.1%	60.6%
NASDAQ OMX	38.1%	36.9%	35.8%	33.5%
NYSE Euronext (US)	18.0%	24.4%	19.2%	20.4%
Santiago SE	45.0%	52.0%	46.7%	53.2%
TMX Group	40.1%	24.8%	23.7%	25.9%
<b>Asia - Pacific</b>				
Australian Securities Exchange	43.6%	41.8%	41.7%	42.7%
Bombay SE	30.8%	20.1%	27.3%	14.5%
Bursa Malaysia	37.1%	36.5%	37.0%	37.4%
Colombo SE	36.9%	19.1%	41.9%	12.7%
Gretai Securities Market	21.7%	29.4%	21.0%	21.0%
Hong Kong Exchanges	37.3%	30.5%	36.9%	29.6%
Indonesia SE	44.3%	44.8%	40.6%	42.3%
Korea Exchange	33.4%	21.4%	32.0%	20.9%
National Stock Exchange India	31.4%	27.6%	27.9%	21.9%
Osaka Securities Exchange	42.4%	59.6%	50.6%	65.8%
Philippine SE	41.2%	43.8%	42.9%	45.7%
Shanghai SE	39.7%	9.1%	36.0%	9.6%
Shenzhen SE	10.9%	7.5%	10.6%	7.1%
Singapore Exchange	25.7%	28.6%	28.1%	59.3%
Taiwan SE Corp.	37.1%	25.7%	33.9%	20.0%
Thailand SE	47.2%	38.8%	45.4%	38.1%
Tokyo SE Group	17.0%	16.6%	17.1%	18.2%
<b>Europe - Africa - Middle East</b>				
Amman SE	71.2%	43.7%	69.9%	49.3%
Athens Exchange	59.8%	86.2%	63.5%	88.2%
BME Spanish Exchanges	37.2%	86.2%	37.3%	84.9%
Budapest SE	95.6%	97.8%	95.6%	99.2%
Casablanca SE	70.4%	74.9%	74.3%	74.1%
Cyprus SE	82.1%	99.6%	82.9%	95.0%
Deutsche Börse	45.1%	50.8%	45.6%	48.8%
Egyptian Exchange	46.4%	45.1%	44.4%	47.8%
Irish SE	88.0%	89.0%	77.7%	85.0%
IMKB <sup>1</sup>	44.9%	43.6%	47.5%	34.7%
Johannesburg SE	25.2%	12.1%	26.4%	34.6%
Ljubljana SE	80.9%	94.2%	79.9%	90.4%
London SE Group	35.1%	35.8%	32.9%	37.8%
Luxembourg SE	95.0%	91.4%	96.6%	96.8%
Malta SE	92.6%	97.7%	93.6%	95.7%
Mauritius SE	56.6%	85.7%	52.9%	84.7%
MICEX	62.1%	96.0%	60.4%	95.5%
NASDAQ OMX Nordic Exchange	36.8%	44.2%	37.9%	41.6%
NYSE Euronext (Europe)	39.2%	31.9%	34.6%	32.0%
Oslo Børs	75.6%	93.3%	62.8%	83.5%
RTS Stock Exchange	62.1%	99.5%	59.0%	99.6%
Saudi Stock Market - Tadawul	58.2%	32.9%	61.8%	47.2%
SIX Swiss Exchange	64.4%	67.5%	60.6%	69.6%
Tel Aviv SE	54.5%	55.6%	52.2%	48.1%
Warsaw SE	53.3%	68.2%	53.4%	68.9%
Wiener Börse	61.7%	78.1%	64.2%	78.6%

**FIGURE 1.5** Top 10 companies, concentration per equity markets. Source: World Federation of Exchanges.

At the same time, the primary equity market along with the secondary market help the investors to get a share in the company that is offering the shares. The investor can also make a good amount of money from this market. The primary that market is also termed as the New Issue Market (NIM) because the Initial Public Offerings (IPOs) are meant for this market.

This market is a source of long-term debt for the companies; because of this, the market can also be termed a long term debt market. The securities that are designed for the public and are introduced through the primary equity market are of two types.

When any new stock is introduced in the market, it is called the Initial Public Offering. At the same time, offering new issues of existing stocks to the purchasers is known as underwriting.

The growing number of companies offering IPOs in the primary equity market represents the growth of the global equity market itself. The growth of the primary equity market is dramatic in the developed countries, and at the same time the numbers of IPOs are rising in the developed countries. Along with this, the mechanism of the primary equity markets has also developed and the competition between various primary equity markets are rising rapidly. This growth of the IPOs also represent the fact that the companies are preferring to generate funds through the primary equity market rather than go to the financial organizations or commercial banks.

Introducing of IPOs in the primary equity market is done through a particular process. According to this process, a syndicate of the securities dealers should perform the job. Because of their services, the securities dealers receive a certain amount of money as their commission. The price at which the IPO is offered in the primary equity market includes the dealer's commission also.

It is important to know if a few companies are dominating the stock exchange's market capitalization and the respective weight of the first 10 corporations to avoid any concentration risk. This can reveal some dispersion between stock exchanges.

### **1.3 The Futures and Options Market**

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The futures market as it currently stands rose from humble beginnings. Futures trading began in the eighteenth century in Japan. It was originally designed for trading in silk and rice. In the 1850s the United States developed a futures market to trade agricultural commodities including cotton, corn, and wheat. A futures contract is an agreement between two parties to engage in a transaction involving physical commodities or financial instruments that will be delivered in the future at a predetermined price. It is a kind of financial contract or derivative instrument. When a person buys a futures contract, they are agreeing to buy a product from the seller at a set price. The product has not yet been produced. The futures market does not necessarily involve large deliveries of commodities because transactions are usually entered into by people wanting to speculate or hedge

their risks. This means that physical goods are not always exchanged. This feature makes the financial instruments of the futures market popular for speculators as well as producers and consumers.

Investors generally agree that the futures market is an important hub of the financial world which allows for competition in trading in products, as well as being an outlet in which price risks can be managed. It is a very complicated and risky market, but breaking it down and considering how it functions can help us to understand it. Futures are a useful trading tool for many different types of people. This information is designed to help you understand the way that the futures market functions, who uses this market, and what strategies work best when trading in futures.

The futures market in North America originated approximately 150 years ago. Before it began, farmers would physically bring their crops to market to sell their inventory. This system meant that they had no idea of the demand; and, if they brought too much with them, any excess in supply would often be left to rot. Another problem was that goods made from crops that were out of season would become very expensive. To deal with these problems, central grain markets and a centralized marketplace were established as places for farmers to sell their products. They could either sell the commodities for immediate delivery (also known as spot trading) or sell for forward delivery. Contracts for forward delivery were the first type of what are now known as futures contracts. Forward contracts prevented a lot of wasted products and profits and also stabilized the supply and prices of off-season products.

The futures market today has grown into a global marketplace that trades all sorts of products, not just agricultural commodities. Currencies and financial instruments are also traded on the futures market. Participants in the futures market include farmers, manufacturers, importers, exporters, and speculators. Technological advances mean that prices of various commodities can be communicated throughout the world, connecting buyers and sellers from different countries.

A futures contract is just what it's called—a contract. It is *not* equity in a stock or commodity. It *is* a contract—a contract to make or take delivery of a product in the future, at a price set in the present. If you agree in April with your Aunt Sue that you will buy two pounds of tomatoes from her garden for \$5, to be delivered to you when they're ripe in July, you and Sue just entered into a futures contract.

In formalized trading of futures contracts on exchanges, standardized agreements specify price, quantity, and the month of delivery. Futures markets have their roots in agriculture, but today futures and options on futures are traded on a wide range of products from wheat to stock indexes, precious metals, and currencies.

Options on futures can be thought of like insurance. An option buyer (the insured) pays a premium to an option seller (the insurance company) for the right to buy or sell a futures contract at a specific price. However, just like with insurance, the option buyer may or may not exercise his right (use his insurance).

Why do futures and options markets exist? Two reasons: risk transfer and price discovery.

Professionals such as grain merchants, energy firms, and portfolio managers use futures and options to reduce the risk to their business associated with volatile prices. For example, a flour miller might use a futures contract to set a price now for wheat that he knows he will need to purchase in the future, rather than face the chance that prices could be even higher when he buys the wheat. Similarly, a natural gas producer might use a futures contract to set a price now for gas he will sell in the future, locking in a profit rather than being exposed to the possibility of lower prices. These types of futures and options users are known as *hedgers*, and they are in the market specifically to reduce risk.

People who assume risk take it on in exchange for the opportunity for profit. Thus the futures and options markets serve the important function of risk transfer.

Futures and options markets also provide the economy with *price discovery*. Futures prices are determined by supply and demand. An exchange itself does not set prices; it simply provides a place where buyers and sellers can negotiate. If there are more buyers than sellers, the price goes up. If there are more sellers than buyers, the price goes down. The prices discovered through futures markets offer valuable economic information about supply and demand in a competitive business environment.

Similar to stocks, gains and losses in futures trading are the result of price changes. If you have sold a futures contract, your trade will show a profit if prices fall. If you have bought, higher prices will produce a profit. To make a profit on a futures trade, you can first buy low and then sell high, or reverse the order and sell high, then buy low.

It is important to understand that losses may be highly *leveraged*. This means that if the price moves in the direction you anticipated, you could realize large profits in relation to your initial investment. Conversely, if prices move in the opposite direction of what you anticipated, you could realize large losses in relation to your initial investment.

Options on futures are different from futures themselves in that the most a buyer can lose is the cost of purchasing the option, known as the *premium*, along with transaction costs. An option seller, however, has unlimited risk. Think of the insurance example we used earlier. The option buyer is like the insured and is paying only the insurance premium for his protection. The option seller is like the insurance company and is taking on unlimited risk in hopes that he can collect the premium and the insurance will not be used.

Should an investor decide to participate in futures or options trading, just as with stocks, there are a number of factors to consider. Similar to trading stocks, in futures you can trade your own account—with or without the recommendations of a brokerage firm. Another alternative is an account that is still your individual account, but you give someone else written power of attorney to make and execute trading decisions on your behalf. You can also choose to use an individual or firm that for a fee provides advice on commodity trading. Yet another choice is to participate in a commodity pool, similar in concept to a

stock mutual fund. Your money is combined with other participants and traded as a single account, and you share in profits or losses in the pool.

## 1.4 The Foreign Exchange Market

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We are not living in a closed economy. Consumers purchase what they need in another economy or country that has a different currency. He will need to exchange his national currency into the foreign currency. Alternatively, the seller will accept the purchaser's currency but will have to exchange it in his country.

The foreign exchange market is by far the largest market in the world. It is an over-the-counter market regulated by a strict code of conduct. The daily turnover is close to an estimated USD 2,500,000,000,000. This largest market in the world is scarcely predictable, although there is a fundamental link between interest rates (reflecting inflation rates), the short- and long-term inflows and outflows of the countries concerned, and the exchange rates of their currencies.

A quotation on the foreign exchange market would be given as follows:

EUR / USD 1.23341–1.23348

where 1.23341 is the buying side being the rate at which the market maker is willing to purchase EURO and sell USD and 1.23348 is the selling side being the rate at which the dealer is willing to sell EURO and purchase USD. This rate is called the *spot rate*.

You could conclude this transaction with delivery three months from now, and it would be called a forward transaction. The foreign exchange markets underpin all other financial markets. They directly influence each country's foreign trade patterns, determine the flow of international investments, and affect domestic interest and inflation rates.

## 1.5 The Commodity Market

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Commodities are traded in both spot and forward markets. They are physical as opposed to financial assets, creating the need for storage and shipping. Because commodities are generally not perishable and can be stored, they are also an asset and can be used as a store of value. Gold and silver have been units of account and numeraires of the entire financial system, as well as a medium of exchange and a store of value. Forward markets for commodities have existed for centuries because, with high volatility, risk-averse producers and consumers have attempted to hedge their inventories in forward and future markets.

Risk managers in any market have a special interest in the pricing forward contracts. One key observation regarding commodities is that the term structure

of the forward curve has often been downward sloped, despite the fact that there are nontrivial storage and other transaction costs. Backwardation of commodity markets is something of a puzzle, since storage costs would normally be expected to raise future prices above spot prices.

Commodities are divided into four types:

- Metals
- Softs
- Grains and oilseeds
- Livestock

These are generally traded in the spot markets and most have evolved forwards, futures, and option-based contracts. The metals can be decomposed into base metals, such as nonferrous metals (e.g., zinc, aluminum, lead, and nickel); strategic metals, such as bismuth and vanadium; minor metals, such as cobalt and chromium; and precious metals, such as gold, silver, and palladium. The London Metals Exchange (LME) is one of the key spot-trading centers for base, nonferrous metals, steel, and certain minor metals. Gold, silver, platinum and other precious metals are traded over-the-counter (OTC) between producer and consumer in markets such as the London Bullion Market, an informal OTC market. The buyers tend to be the automotive, aerospace, pharmaceutical, and electrical corporations.

The softs include cocoa, sugar, and coffee, and minor softs include rubber, tea, and pepper. Most trading of soft commodities involves processors, roasters, refiners, distributors, and traders who are “inventory flow traders” or speculators. The grains and oilseeds category spans most edible agriculture products. It can be further decomposed into the grains, such as wheat, barley, rice, and oats; oilseeds, such as soybeans, rapeseed, palm kernel, and flaxseed; fibers, such as wood, cloth, and silk; and finally, livestock and other, including live animals and meat products such as pork bellies. Also included in the latter category are dairy products, such as milk and cheese, and citrus and tropical fruits, such as orange juice.

The most important commodity exchanges belong to the Chicago Mercantile Exchange (CME) Group, such as the Chicago Board of Trade (CBOT); the New York Mercantile Exchange (NYMEX); the Intercontinental Exchange (ICE); the London International Financial Futures and Options Exchange (LIFFE); and the London Metals Exchange (LME).

Irrespective of whether the commodity is traded spot, forward, or futures, the delivery and settlement methods are critical in determining the actual spot, forward, or futures price. There are at least six characteristics of delivery mechanisms:

1. *In Store*. The simplest form of physical delivery. The seller is responsible for the delivery to an agreed-upon warehouse. As in all physical deals, quality,

quantity, and location are all negotiated or embedded in the terms of a standardized (futures) contract. It is used, for example, in softs such as coffee and cocoa.

2. *Ex Store*. It is identical to in store except that the seller prepays the store-keeper for loading onto the buyers' transportation network. Thus the price will be more expensive than the former.
3. *Free on Board (FOB)*. Once the goods have passed over the ship's rail, the seller has fulfilled his obligations. The onus of risk is shifted onto the buyer once goods are loaded, and hence an FOB price will be cheaper by the insurance premium for damage while on board along with the transportation costs.
4. *Free Alongside Ship (FAS)*. It is similar to FOB, whereby the goods are delivered alongside the shipping vessel instead of being loaded. The FAS price will be lower than the FOB price by the cost of loading.
5. *Cost, Insurance, and Freight (CIF)*. This involves FOB delivery plus the costs of insurance and transportation. The following simple arbitrage equation relates the FOB to the CIF price:  $CIF = FOB + F + I$ , where  $F$  is the freight cost and  $I$  is the insurance premium.
6. *Exchange of Futures for Physicals (EFP)*. It is possible to swap a physical position for a future position, and this will be subject to off-exchange negotiations.

As a risk manager it is important to recognize the transactions' characteristics of the different types of commodities, which focus on delivery and settlement mechanisms for heterogeneous commodities. The key arbitrage equation which links spot prices with forward prices is the commodity equivalent of covered interest arbitrage in foreign exchange or interest parity in bonds. Unlike other markets, the arbitrage equation for commodities contains a convenience yield which reflects the importance that is sometimes placed on immediate access to supply. This feature of commodity markets is no doubt related to the importance of commodities as factors of production and possible delays in supply/shipping. It is the presence of convenience yield, along with its variability, that makes commodity risk management unique. Failure to properly appreciate these aspects of commodity markets can have disastrous consequences.

**Energy Markets.** Energy trading began in 1978 with the first oil futures contract in NYMEX. During the 1980s and 1990s, NYMEX and the International Petroleum Exchange (IPE), now called ICE Futures, successfully launched futures contracts for oil and gas futures trading. These successful energy future exchanges have survived the trading debacles of recent years, of which Enron was the most notable. Oil companies and financial houses now provide the necessary trading liquidity through market-making on both the established government-regulated futures exchanges and OTC energy derivatives markets that can clear on the futures exchanges. They have considerable skill in the



management of financial energy risks and the risks in the emerging global environmental markets.

The energy complex trades the following products on established futures exchanges, OTC markets, and the internet: crude oil, gasoline, naphtha, gasoil, jet fuel, home heating oil, residual heating oil, bunker fuels, freight-rate swaps, natural gas, electricity, liquefied natural gas (LNG), petrochemicals, coal, emissions such as sulfur dioxide and nitrous oxides, greenhouse gases (i.e., carbon credits), renewable energy credits, and megawatts (value of energy efficiency).

Energy commodities are subject to numerous risks, including credit or counterparty risk, liquidity risk, event risk, cash-flow risk, basis risk, legal and regulatory risk, operational risks, tax risk, and most evidently geopolitical and weather risks. There are also tremendous variations over time in many energy markets. The weather (seasonal) impacts supply and demand so that risks increase in the mid-summer and winter seasons as more energy is required for heating, cooling, and transportation. Of all the different types of risks that affect the energy markets, market risk is still preeminent. Price volatility is caused by fundamental factors such as supply/demand, as well as by weather and financial factors such as technical trading, speculators, and market imperfections. These factors are very well defined in energy markets, and as a result they are the most volatile commodity markets ever created.

A standardized energy futures contract always comprises certain characteristics. It has an underlying physical commodity or price index upon which the energy futures contract is based. There is a certain size for the amount of the underlying item covered by each futures contract. There is a predetermined and specified time given in months for which contracts can be traded. There is an expiration date. Finally, there is a specified grade or quality and delivery location for oil and coal future contracts. Whereas oil varies by grade/quality, natural gas (methane) and electricity are more homogeneous commodities, obviating the need for the grade/quality to be specified in the contract. The settlement mechanism can be either physical delivery of the underlying item or cash payment.

A few decades after the first successful oil futures contracts, we are now seeing the development of a true multicommodity market that encompasses oil, gas, power, coal, freight rates, weather, and green trading. Energy commodity trading is evolving into many areas of the energy complex and extending into emerging markets such as coal, emissions, and weather trading. Convergence (a term often much overused) is actually now upon us as multicommodity arbitrage is the watchword of today's energy trader. High price volatility, the extra liquidity provided by financial institutions, and a greater risk appetite are three major factors that make the present time the real dawn of energy trading. Energy risk management has become not only a fiduciary responsibility but also a core competency of energy companies. Broader penetration into the emerging markets of the developing world, and particularly Asia, shows that there are no barriers to entry in trading on the internet. The true financialization of the energy markets is upon us.

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