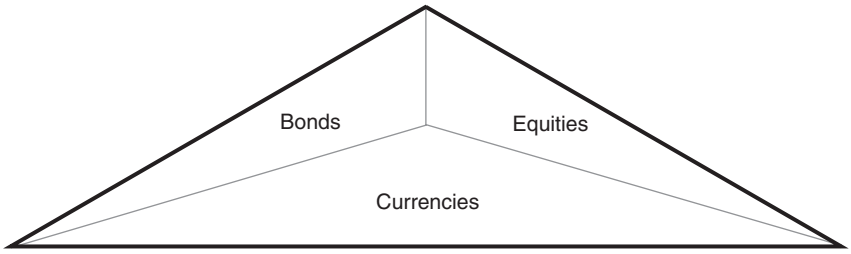
PART
ONE

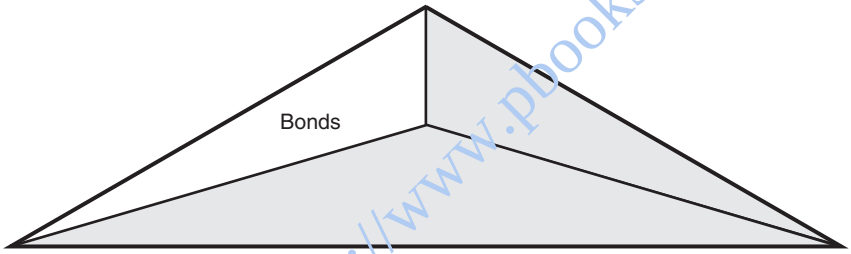
Products, Cash Flows, and Credit

CHAPTER 1

Products



This chapter provides working definitions for bond, equity, and currency, and discusses similarities and differences between bonds and equities.



Perhaps the most basic definition of a bond[1] is that it is a financial instrument with a *predetermined life span* that embodies a *promise* to provide one or more *cash flows*. The life span of the security is generally announced at the time it is first launched into the market, and the longest *maturities* tend to be limited to about 30 years.[2]

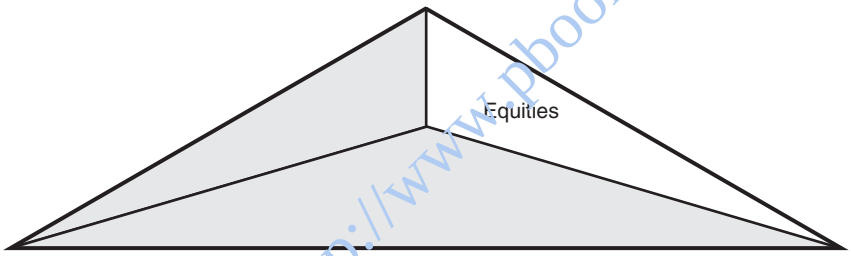
[1]A bond typically is viewed as a fixed income instrument with more than 10 years to maturity, while a note typically is viewed as a fixed income security with 10 years or less to maturity. Fixed income securities with a year or less to maturity are typically referred to as money market instruments. In this text, all fixed income products are referred to as bonds.

[2]From time to time so-called century bonds are issued with a life span of 100 years.

Cash flows generally consist of periodic *coupons* and a final payment of *principal*. Coupons typically are defined as fixed and regularly paid amounts of money, and usually are set in relation to a percent of the principal amount. For example, if the coupon of a bond is set at 8 percent and is paid twice a year over five years, and if the principal of the bond is valued at $1,000, then every six months the investor will receive $40.

$$\$1{,}000 \times 8\%/2 = \$40$$

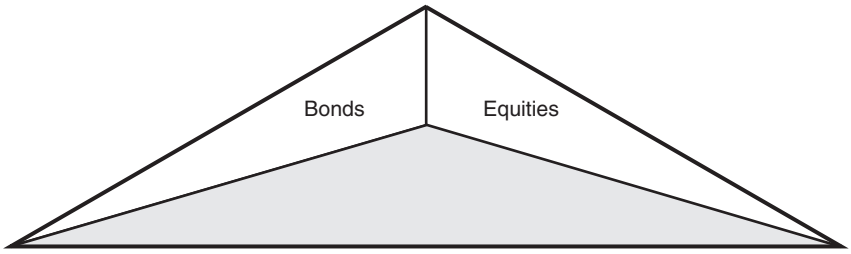
A bond *issuer* is the entity selling the bonds to *investors*. The issuer then has the opportunity to use the money received to finance various aspects of its business, and the investor has the opportunity to earn a rate of return on the money lent. In sum, the issuer has incurred a *debt* that is owed to the investor. If the issuer becomes unable to pay back the investor (as with a *bankruptcy*), the bond investor generally is protected by law to have a *priority ranking* relative to an equity investor in the same company. Priority ranking means that a bondholder will be given preference over an equity holder if a company's assets are sold off to make good on its obligations to investors. Chapter 3 presents more information on bankruptcy.



Perhaps the most basic definition of equity is that it's a financial instrument without a predetermined life span. An equity may or may not pay cash flows called *dividends*. Dividends typically are paid on a quarterly basis and usually are paid on a per-share basis. For example, if a dividend of 34 cents per share is declared, then every *shareholder* receives 34 cents per share. Unlike a bond, an equity gives an investor the right to vote on various matters pertaining to the issuer. This right stems from the fact that a *shareholder* actually owns a portion of the issuing company. However, unlike a bondholder, a shareholder does not enjoy a preferential ranking in the event of a bankruptcy.

With the benefit of these working definitions for bonds and equities, let us consider what exactly is meant by the words "promise," and "priority,"

and when and by what criteria a bond might begin to look more like an equity and vice versa.



PROMISES AND PRIORITIES

At issue here is not so much the sincerity of an issuer wanting to keep a promise, but rather the business realities affecting an issuer's ability to make good on the financial promises it has made. Ability, in turn, involves any number of factors, including *financial fundamentals* (as with key financial ratios), quality of company management, economic standing relative to *peer group* (other comparable companies if there are any), and the *business cycle* (strength of economy).

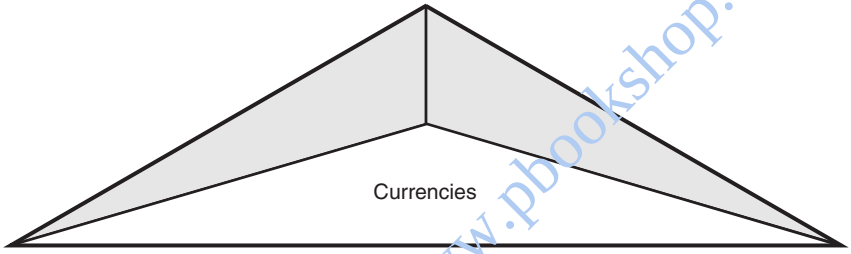
Various entities within the marketplace have an interest in monitoring a given company's likelihood of success. These entities range from individual investors who use any number of valuation techniques (inclusive of visiting the issuer to check out its premises and operations) to governmental bodies (e.g., the Securities and Exchange Commission). Increasingly the *investment banks* (firms that assist issuers with bringing their deals to market) also are actively practicing *due diligence* (evaluation of the appropriateness of funding a particular initiative.)

A bond issuer that fails to honor its promise of paying a coupon at the appointed time generally is seen as suffering very serious financial problems. In many instances the failure to make good on a coupon payment equates to an automatic *distressed* (company is in serious financial difficulty) or *default* (company is unable to honor its financial obligations) scenario whereby bondholders are immediately vested with rights to seize certain company assets. By contrast, companies often choose to dispense with otherwise regularly scheduled dividend payments and/or raise or lower the dividend payment from what it was the previous time one was granted. While a skipped or lowered dividend may well raise some eyebrows, investors usually look to the explanation provided by the company's officers as a guide. For example, a dividend might be lowered to allow the company to build

up a larger cash reserve that it can use for making strategic acquisitions, and shareholders might especially welcome such an event.

When a bankruptcy or distressed or default situation does arise, it is imperative to know exactly where an investor stands in regard to collecting all or a portion of what the issuer originally had promised to pay. As stated, bondholders stand in line ahead of equity holders. However, there are various classifications of bondholders and shareholders, and there are materially different priorities as to how these categories are rated and treated. Chapter 3 delves into the nuances of what these classifications mean. Figure 1.1 presents a continuum of investment products that depicts investor rankings in an event of default.

Table 1.1 summarizes this section on bonds and equities. These characteristics are explored further in later chapters, where it is shown that while these characteristics may hold true generally as meaningful ways to differentiate a bond from an equity, lines also can become blurred rather quickly.



Like equities and bonds, currencies are also investment vehicles, a means to earn a return in the marketplace. Investors based in country X might choose to save *local currency* (U.S. dollar for the United States) holdings in something like an interest-bearing checking account or a three-month *certificate of deposit* (a short-term money market instrument) or they might even stuff it under a mattress. Alternatively, they might choose to spend local currency

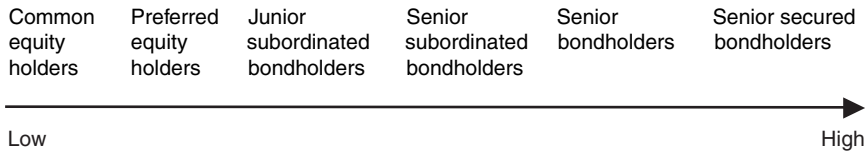


FIGURE 1.1 Continuum of product rankings in the event of default (from lowest credit protection to highest).

TABLE 1.1 Similarities and Differences of Equities and Bonds

	Equities	Bonds
Entitles holder to vote	√	
Entitles holder to a preferable ranking in default		√
Predetermined life span		√
Has a price	√	√
Has a yield	√	√
May pay a coupon		√
May pay a dividend	√	

by purchasing goods or services or other investment vehicles, including equities, bonds, real estate, precious metals, or even other currencies.

A currency typically is thought of as a unit of *implied value*. I say "implied value" because in contrast with times past, today's coins and paper money are rarely worth the materials used to make them and they tend not to be *backed by* anything other than faith and trust in the government minting or printing the money. For example, in ancient Rome, the value of a particular coin was typically its intrinsic value—that is, its value in its natural form of silver or gold. And over varying periods of time, the United States and other countries relied on linking national currencies to gold and/or silver where paper money was sometimes said to be backed by gold or subject to a *gold standard*—that is, actual reserves of gold were set aside in support of outstanding supplies of currency. The use of gold as a centerpiece of currency valuation pretty much faded from any practical meaning in 1971.

Since the physical manifestation of a currency (in the form of notes or coins) is typically the responsibility of national governments, the judgment of how sound a given currency may be generally is regarded as inexorably linked to how sound the respective government is regarded as being. Rightly or wrongly, national currencies today typically are backed by not much more than the confidence and expectation that when a currency (or one of its *derivatives*, as with a check or credit card) is presented for payment, it typically will be accepted. As we will see, while the whole notion of currencies being backed by precious metals has faded as a way of conveying a sense of discipline or credibility, some currencies in the world are backed by other currencies, for reasons not too dissimilar from historical incentives for using gold or silver.

While the value of a stock or bond generally is expressed in units of a currency (e.g., a share of IBM stock costs $57 or a share of Société Generale stock costs €23), a way to value a currency at a particular time is to measure how much of a good or service it can purchase. For example, 40 years

ago $1 probably could have been exchanged for 100 pencils. Today, however, 100 pencils cost more than $1. Accordingly, we could say that the value of the dollar has *depreciated*; it buys fewer pencils today than it did 40 years ago. To express this another way, today we have to spend more than $1 to obtain the same 100 pencils that people previously spent just $1 to obtain. Spending more money to purchase the same goods is a classic definition of *inflation*, and inflation certainly can contribute to a currency's *depreciation* (weakening relative to another currency). Conversely, *deflation* is when the same amount of money buys more of a good than it did previously, and this can contribute to the *appreciation* (strengthening relative to another currency) of a currency. Deflation may occur when there is a technological advancement with how a good or service is created or provided, or when there is a surge in the *productivity* (a measure of efficiency) involved with the creation of a good or providing of a service.

Another way to value a currency is by how many units of some other currency it can obtain. An *exchange rate* is defined simply as being the measure of one currency's value relative to another's. Yet while this simple definition of an exchange rate may be true, it is not very satisfying. Exchange rates generally tend to vary over time; what influences how one currency will trade in relation to another? Well, no one really knows precisely, but a couple of theories have their particular devotees, and they are worth mentioning here. Two of the better-known theories applied to exchange rate pricing include the theory of interest rate parity and purchasing power parity theory.

INTEREST RATE PARITY

Assume that the annual rate of interest in country X is 5 percent and that the annual rate of interest in country Y is 10 percent. Clearly, all else being equal, investors in country X would rather have money in country Y since they are able to earn more *basis points*, or *bps* (1% is equal to 100 bps), in country Y relative to what they are able to earn at home. Specifically, the *interest rate differential* (the difference between two yields, expressed in basis points) is such that investors are picking up an additional 500 basis points of yield. However, by investing money outside of their home country, investors are taking on exchange rate risk. To earn the rate of interest being offered in country Y, investors first have to convert their country X currency into country Y currency. At the end of the investment horizon (e.g., one year), international investors may well have earned more money via a rate of interest higher than what was available at home, but those gains might be greatly affected (perhaps even entirely eliminated) by swings in the value of respective currencies. The value of currency Y could fall by a large amount rela-

tive to currency X over one year, and this means that less of currency X is recovered.

Indeed, the theory of interest rate parity essentially argues that on a fully hedged basis, any differential that exists between the interest rates of two countries will be eliminated by the differential in exchange rates between those two countries. Continuing with the preceding example, if a forward contract is purchased to exchange currency Y for currency X at the end of the investment horizon, the pricing embedded in the forward arrangement will be such that the currency loss on the trade will exactly offset the gain generated by the interest rate differential. That is, currency Y will be priced so as to depreciate relative to currency X, and by an equivalent magnitude of 500 bps. In short, whatever interest rate advantage investors might enjoy initially will be eliminated by currency depreciation when a strategy is executed on a hedged basis.

When currency exposures are left unhedged, countries' interest rates and currency values may move in tandem or inversely to other countries' interest rates and currency values. Given the right timing and scenario, international investors could not only benefit from the higher rate of interest provided by a given market, but at the end of the investment horizon they might also be able to exchange an appreciated currency for their weaker local currency. Accordingly, they obtain more of their local currency than they had at the outset, and this is due to both the higher interest rate and the effect of having been in a strengthening currency. Nonetheless, many portfolio managers swear by the offsetting nature of yield spreads and currency moves and argue that, over time, these variables do manage to catch up to one another and thus mitigate long-term opportunities of any doubling of benefits in total return when investing in nonlocal currencies. Figure 1.2 illustrates this point. As shown, there is a fairly meaningful correlation between these two series of yield spreads and currency values.

In summary, while interest rate differentials may or may not have meaningful correlations with currency moves when currencies are unhedged, on a fully hedged basis there is no interest rate or currency advantage to be gained. As is explained in the next chapter, interest rate differentials are a key dynamic with determining how *forward exchange rates* (spot exchange rates priced to a future date) are calculated.

PURCHASING POWER PARITY

Another popular theory to explain exchange rate valuation goes by the name of purchasing power parity (PPP).

The idea behind PPP is that, over time (and the question of what period of time is indeed a relevant and oft-debated question), the purchasing ability

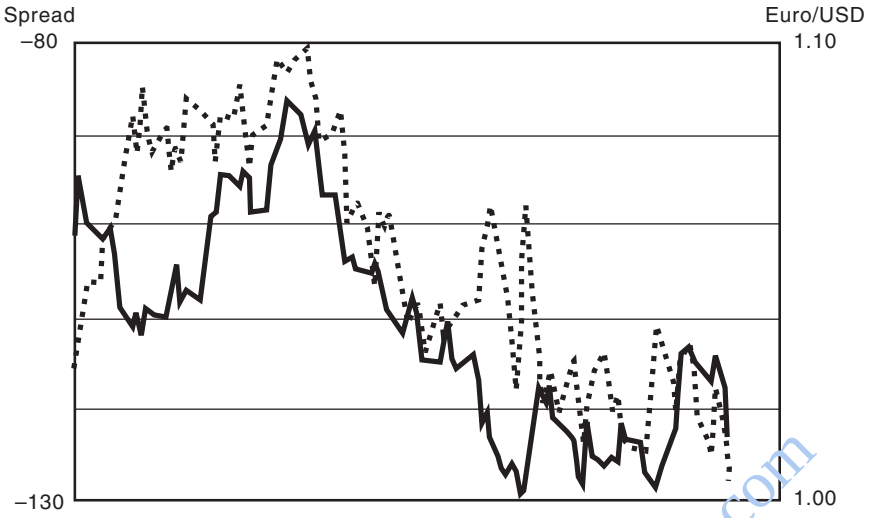


FIGURE 1.2 Yield spread between 10-year German and U.S. government bonds and the euro-to-dollar exchange rate, September 1, 1999, to January 15, 2000.

of one currency ought to adjust itself to be more in line with the purchasing power of another currency. Broadly speaking, in a world where exchange rates are left free to adjust to market imbalances and disequilibria in a price context, exchange rates can serve as powerful equalizers. For example, if the currency of country X was quite strong relative to country Y, then this would suggest that on a relative basis, the prices within country Y are perceived to be lower to consumers in country X. Accordingly, as the theory goes, since consumers in country X buy more of the goods in country Y (because they are cheaper) and eventually bid those prices higher (due to greater demand), an equalization eventually will materialize whereby relative prices of goods in countries X and Y become more aligned on an exchange rate–adjusted basis.

Although certainly to be taken with a grain of salt, *Economist* magazine occasionally updates a survey whereby it considers the price of a McDonald's Big Mac on a global basis. Specifically, a Big Mac price in local currency (as in yen for Japan) is divided by the price for a Big Mac in the United States (upon conversion of yen into dollars). This result is termed "purchasing power parity," and when compared to respective actual dollar exchange rates, an over- or undervaluation of a currency versus the dollar is obtained. The presumption is that a Big Mac is a relatively homogeneous product type and accordingly represents a meaningful point of reference. A rather essential (and perhaps heroic) assumption to this (or any other comparable PPP exercise) is that all of the ingredients that go into making a Big Mac are accessible in

each of the countries where the currencies are being compared. Note that "equal" in this scenario does not necessarily have to mean that access to goods (inputs) is 100 percent free of tariffs or any type of trade barrier. If trade were indeed completely unfettered then this would certainly satisfy the notion of equally accessible. But if all goods were also subject to the same barriers to access, this would be equal too, at least in the sense that equal in this instance means equal barriers. Yet the vast number of trade agreements that exist globally highlights just how bureaucratic the ideal of free trade can become even if perceptions (and realities) are such that trade today is generally at the most free it has ever been. Another important and obvious consideration is that certain inputs might enjoy advantages of proximity. Beef may be more plentiful in the United States relative to Japan, for example.

The very fact that there is both an interest rate theory to explain currency phenomenon and a notion of purchasing power parity tells us that there are at least two different academic approaches to thinking about where currencies ought to trade relative to one another. No magic keys to unlocking unlimited profitability here! But like any useful theories commonly applied in any field, here they are popular presumably because they manage to shed at least some light on market realities. Generally speaking, market participants tend to be a rather pragmatic and results-oriented lot; if something does not "work," then its wholesale acceptance and use is not very likely.

So why is it that neither interest rate parity nor purchasing power parity works perfectly? The answer lies within the question: The markets themselves are not perfect. For example, interest rates generally are influenced to an important degree by national central banks that are trying to guide an economy in some preferred way. As interest rates can be an important tool for central banks, these are often subject to the policies dictated by well-meaning and certainly well-informed people, yet people do make mistakes. Monetarists believe that one way to eliminate independent judgment of all kinds (both correct and incorrect) is to allow a country's monetary policy to be set by a fixed rule. That is, instead of a country's money supply being determined by human and subjective factors, it would be set by a computer programmed to allow only for a rigid set of money growth parameters.

As to other price realities in the marketplace that may inhibit a smoother functioning of interest rate or PPP theories, there are a number of considerations, including these three.

1. Quite simply, the supply and demand of various goods around the world differ by varying degrees, and unique costs can be incurred when special efforts are required to make a given good more readily available. For example, some countries can produce and refine their own oil, while others are required to import their energy needs.

2. The cost of some goods in certain countries are subsidized by local governments. This extra-market involvement can serve to skew price relationships across countries. One example of how a government subsidy can skew a price would be with agricultural products. Debates around these subsidies can become highly charged exchanges invoking cries of the need to take care of one's own domestic producers, to appeal for the need to develop self-reliant stores of goods so as to limit dependence on foreign sources. Accordingly, by helping farmers and effectively lowering the costs borne to produce foodstuffs, these savings are said to be passed along to consumers who enjoy lower-cost items relative to the price of imported things. Ultimately whether this practice is good or bad is not likely to be answered here.
3. As alluded to above, tariffs or even total bans on the trade of certain goods can have a distorting effect on market equilibriums.

There are, of course, many other ways that price anomalies can emerge (e.g., with natural disasters). Perhaps this is why the parity theories are most helpful when viewed as longer-run concepts.

Is there perhaps a link of some kind between interest rate parity and purchasing power parity? The answer to this question is yes, the link is inflation. An interest rate as defined by the Fischer relation is equal to a real rate of interest plus expected inflation (as with a measure of CPI or Consumer Price Index). For example, if an annual nominal interest rate is equal to 6 percent and expected inflation is running at 2.5 percent, then the difference between these two rates is the real interest rate (3.5 percent). Therefore, inflation is an important factor with interest rate parity dynamics. Similarly, price levels within countries are affected by inflation phenomena, and so are price dynamics across countries. Therefore, inflation is an important factor with PPP dynamics as well. In sum, whether via a mechanism where an interest rate is viewed as a "price" (as in the price to borrow a particular currency) or via a mechanism where a particular amount of a currency is the "price" for obtaining a certain good or service, inflation across countries (or, perhaps more accurately, inflation differentials across countries) can play an important role in determining respective currency values.

As of this writing, there are over 50 currencies trading in the world today.[3] While many of these currencies are well recognized, such as the U.S. dollar, the Japanese yen, or the United Kingdom's pound sterling, many are not as well recognized, as with United Arab Emirates dirhams or Malaysian ringgits. Although lesser-known currencies may not have the same kind of recognition as the so-called majors (generally speaking, the currencies of the

[3]International Monetary Fund, *Representative Exchange Rates for Selected Currencies*, November 1, 2002.

Group of Seven, or G-7), lesser-known currencies often have a strong price correlation with one or more of the majors. To take an extreme case, in the country of Panama, the national currency is the U.S. dollar. Chapters 3 and 4 will discuss this and other unique currency pricing arrangements further.

The G-7 (and sometimes the Group of Eight if Russia is included) is a designation given to the seven largest industrialized countries of the world. Membership includes the United States, Japan, Great Britain, France, Germany, Italy, and Canada. G-7 meetings generally involve discussions of economic policy issues. Since France, Germany, and Italy all belong to the European Union, the currencies of the G-7 are limited to the U.S. dollar, the pound sterling, Canadian dollar, the Japanese yen, and the euro. The four most actively traded currencies of the world are the U.S. dollar, pound sterling, yen, and euro.

CHAPTER SUMMARY

This chapter has identified and defined the big three: equities, bonds, and currencies. The text discussed linkages among equities and bonds in particular, noting that an equity gives a shareholder the unique right to vote on matters pertaining to a company while a bond gives a debtholder the unique right to a senior claim against assets in the event of default. A discussion of pricing for equities, bonds, and currencies was begun, which is developed further in a more mathematical context in Chapter 2.

As a parting perspective of the similarities among bonds, equities, and currencies, it is well to consider if one critical element could serve effectively to distinguish each of these products. In the case of what makes an equity

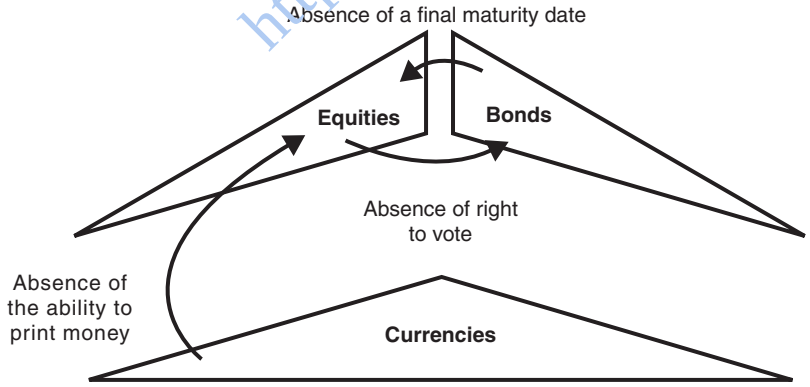


FIGURE 1.3 Key differences among bonds, equities, and currencies.

an equity, the Achilles' heel is the right to vote that is conveyed in a share of common stock. Without this right, an equity becomes more of a hybrid between an equity and a bond. In the case of bonds, a bond without a stated maturity immediately becomes more of a hybrid between a bond and an equity. And a country that does not have the ability to print more of its own money may find its currency treated as more of a hybrid between a currency and an equity. Figure 1.3 presents these unique qualities graphically. The text returns time and again to these and other ways of distinguishing among fundamental product types.