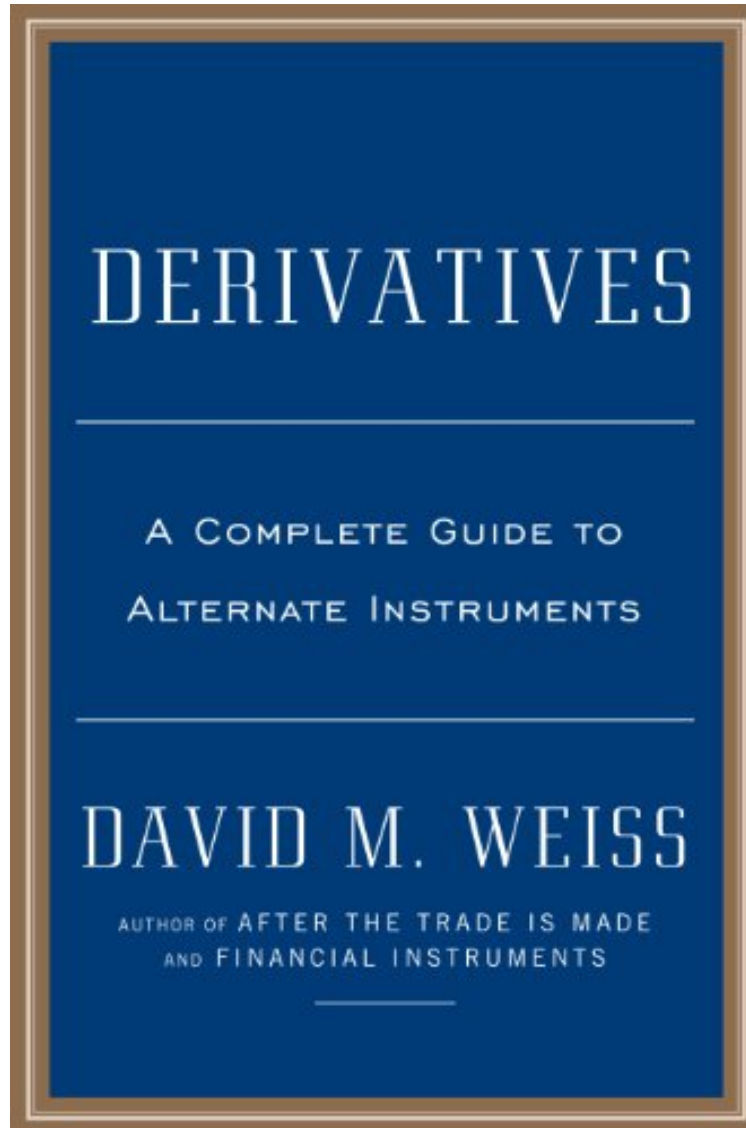


(Free) Derivatives: A Guide to Alternative Investments

Derivatives: A Guide to Alternative Investments

David M. Weiss

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A guide to understanding the complex derivatives market, by the acclaimed author of *After the Trade is Made* In today's highly charged and rapidly changing financial climate, derivatives are dominating global headlines. It is essential for financial professionals to have a strong grasp of the products, practices, and regulatory agencies

associated with the complex derivatives market in order to keep up. In this book, financial expert David Weiss introduces readers to the basic concept of a derivative and offers a thorough examination of the many derivative products. Breaking down a complex market into its basic parts, he systematically explains the structure, usage, and value aspect of all the products constituting the derivatives universe, including: Credit Default Swaps (CDS) Asset-Backed Securities (ABS) Exchange-Traded Funds Currency Rates Swaps Options Futures Forwards For each of these types of derivatives, Weiss introduces the players in the market, outlines the mechanics of trading, and explains the role of regulation and oversight in the process. Written for portfolio managers, brokers, financial planners, and institutional investors, this book is an indispensable tool for today's investor and will leave readers better equipped to understand one of finance's most complex arenas.

About the Author DAVID M. WEISS, author of *After the Trade Is Made* and *Financial Instruments*, has been in the brokerage industry for more than thirty years. He is currently a consultant, an educator, and a source material expert at Dunbar Associates Ltd. He also develops educational programs, processing manuals, and system flow analysis through Maracra. A former vice president of global operations for Goldman Sachs, he has also worked for the New York Stock Exchange, and he is a long-standing faculty member of the New York Institute of Finance. Excerpt. copy; Reprinted by permission. All rights reserved. | CONTENTS | INTRODUCTION This book has been written to meet the needs of users in a changing marketplace. The financial industry has always been in a constant state of change; certain aspects of the industry change faster than others, creating an imbalance, and then those areas left behind catch up, prompting the process to start over again. This consistent change keeps industry professionals on their toes, trying to stay abreast of the latest developments. The financial market has completely changed from when I penned my first book in 1986. Within that time span there has been a consolidation of assets from individuals' accounts into the professional management of financial institutions. With that consolidation came the accumulation of huge sums of assets that needed to be invested, drastically increasing the scale of investments. Also, during that time automation and electronic markets did away with many manual processing steps, which greatly reduced the processing time of the more traditional products. As time was freed up, the way was paved for new types of products, and more complex variations of existing products could now be offered in the marketplace. Most of the newer products are a result of technological advances that permit complex computations to be made at split-second speeds and make way for spontaneous analysis and projections of outcomes. Products designed to take advantage of new technologies can magnify profits and minimize losses. They can also be combined or packaged with other products, thereby allowing for a new set of results. These same technical advances broke down country borders and boundaries, making our once domestic market into an international and then a global one. This, in turn, demanded the development of computer software programs that permitted twenty-four-hour trading, which led to a major increase in the use of foreign currency exchange and trading on foreign markets, shrinking the globe even more. The algorithms that were developed allowed for the solving of complex and time-consuming formula calculations, permitting new classes of products to enter the fold and new methods for assessing risk to be employed. Some of these new products are classified as "derivatives"; others are referred to as "structured products"; and still others simply broadened the base of those "steak and potatoes" products, such as equities and bonds. As the participants became more familiar with these new products, their applications led to the need for other new products. For example, over-the-counter options existed for centuries but the establishment of "exchange listed" options in 1973 gave forth a new type of option product, which in turn gave way to a rash of other types of option products. Today, the buyer, seller, or trader who is involved with this last range of products is actually three layers away from the underlying product. For example, using products that are explained throughout the book: the trading of an option contract (layer #1) that is based on a future product contract (layer #2) that is based on a predetermined quantity of a commodity (layer #3) or the trading of an exchange-traded fund (ETF) (layer #1) that is based on an equity index (layer #2), which is based on a select group of underlying common stocks (layer #3). If the professional takes the time to deeply understand the products as well as the relationship of products to one another, a profit may be anticipated and a loss may be controlled. Those who don't bother to learn hurt not only themselves but also others in the market. The reader must keep in mind two very important facts throughout this book. First, all examples in the book are fictional situations isolated to serve as examples, whereas real-world examples are dynamic and change rapidly. Second, in some of the examples assumptions are made to facilitate the explanations, sometimes oversimplifying the situation to make the point. Armed with those facts and with a mind eager to understand new and exciting products, you will be in good shape to approach the book. I trust you will find the material here both informative and interesting. CHAPTER 1 DERIVATIVES DEFINED As the derivatives market evolved, traders developed specialized terms for discussing its various products. A basic understanding of these terms is essential to a study of derivatives, so this chapter will focus on providing a few essential definitions. • WHAT IS A DERIVATIVE PRODUCT? • A derivative product is one that derives its value from another product or other products. For example: the value of a future contract (a type of derivative) on wheat is based on the current price of wheat; it derives its value from the price of wheat. Many other factors contribute to the wheat futures' value, but it is still based on the price of today's wheat. Types

of Derivatives There are many ways to sort or categorize derivative products. One way is to divide derivatives into two categories. The first category contains the derivatives that benefit the issuer of the derivatives' underlying product, the second is the derivatives that give the issuer no direct financial benefit. The derivatives in both of these categories derive their values from the value of the underlying product. An example of the first type occurs when a corporation issues a bond with warrants attached. What they are issuing is a debt product (the bond) with which they are borrowing money for a period of time (the duration of the bond) and will have to pay interest over the bond's life: they are also issuing an opportunity for the warrant holder to invest in the common stock of that company at a later time, should that investment appear appealing at that point. In other words, the warrant has a life of its own with an expiration date and the price the warrant holder will have to pay if he or she wants to take advantage of the opportunity. Both products, the bond and the warrant, are offered initially as a "unit." With this unit the issuer has the possibility of raising funding from two sources: the borrow, which is made against the bond, and the potential investment, which is made later by the warrant holder in the issuer's common shares, thereby benefiting from the issuance of those shares. Options, forwards, futures, forward rate agreements, exchange-traded funds, mutual funds, unit investment trusts and other mortgage-backed securities, asset-backed securities, and covered bonds are all types of derivatives that do not benefit the issuer of the original or underlying product. For an example of these other types of derivatives, we will use a listed option product that trades on an exchange. The buyer and seller of the option contract are anticipating changes in the underlying issuer's market value that will benefit them. The issuer of the underlying product does not receive compensation of any kind from the buying and selling of the option. In the arena of derivative products, those benefiting the issuer include warrants, rights, units, and privately placed options. Included, although stretching the concept a bit, is the initiation of collateralized debt obligations (CDOs), which we will discuss in depth in chapter 21 to the extent that they represent packages of loans made by a financial institution and through their sale, the institution can recoup its expenditures in order to continue to make loans.

• WHAT IS A STRUCTURED PRODUCT? • A structured product is a combination of two or more products designed in the anticipation of achieving a particular goal. The important word is "anticipation," as the result is not guaranteed. The component parts are offered as a package. Sometimes the "package" is issued under a trust. One of the simplest examples of a structured product can be found within the option world. It is called the buy/write. The principal buys shares (100 shares is a trading lot) of a stock because the corporation that issued it pays a good-size quarterly dividend and the stock purchaser is not anticipating capital appreciation. In this particular strategy the principal wants the value of the stock to remain stagnant. Against the purchase, the principal sells an "out of the money" call on the same stock, thereby earning the option premium. As long as the stock doesn't rise in value to the point where the owner of the option will call the stock away, the principal can earn the dividend and enhance that income with the premium received from the option. Here's an example: Mr. Chuck Spear purchases a package consisting of the acquisition of 1,000 shares Marnee common stock @ \$38 per share (the stock pays a dividend of \$1.00 per share annually, which is paid quarterly) and the sales of ten call options (option represents 100 shares) expiring in six months with a strike price of \$40 for \$1 per underlying share. Putting commission and fees costs aside, the package cost \$37 (\$38 minus \$1) per share. Assuming the stock does not rise above \$40 per share, the option will expire and be worthless. Mr. Spear has earned \$0.50 in dividends during the six-month period and \$1 from the sale of the now worthless option for a total of \$1.50, versus just the dividend of \$0.50 had the options not been sold. This strategy and others, including risks, are discussed later in this book.

• THE BASICS • The financial industry, like most industries, runs on credit. Some participants arrange financing for their clients, who use it to finance their own company's operation—often by arranging private loans, underwriting their company's securities, and advising on mergers, acquisitions, or consolidations. This financing originates with lenders, known as clients. Banks lend money received from depositors, and broker-dealers offer securities for their clients to buy (more funding). These same clients acquire and sell the securities using financing as the conduit. The use of all this financing involves interest charges. The amount of interest charged depends on the creditworthiness of the borrower.

What Is a Broker-Dealer? • Broker-dealer is a catchall term for any firm that must be registered with the Securities and Exchange Commission (SEC) to do brokerage business with the public. This general term encompasses broker-dealers whose customers are institutions, those that focus on retail customers, and those that are national, international, or multinational firms.

What Does an Investment Bank Do? An investment bank may or may not be a broker-dealer; the usual operation either is or has an affiliation with one. Typically an investment bank is the intermediary between a corporation or other institution and the public markets. An investment bank can assist a young company in raising short-term funding by introducing the company to lending operations such as venture capitalists or broker-dealers that specialize in the placement of this type of financing. As the company grows, its need for financing grows and the investment bank assists it in preparing to issue securities to the public. This process is known as underwriting an initial public offering (IPO). As the company continues to grow the investment bank will continue to assist it if it is issuing securities.

Corporate Actions Investment banks also assist their corporate clients through the steps necessary to execute a merger or acquisition. This assistance ranges from locating prospective candidates to helping to thwart an unwanted takeover. Of importance to this book is the role investment banks play in the derivative and

structured markets. It is the clients of the investment bank that need and use these products. It is these firms that have the financial strength to support these strategies, to take the opposite side when necessary, and to facilitate the transaction through their contacts. They are basically set up to focus on a few large transactions per day. Investment banks bring new issues to market. They underwrite the issue, meaning they buy the issue from the issuer and sell the product into the market. Once issued, the product begins secondary trading as the new buyers sell their new issue to market makers, who in turn sell them to new buyers, and the trading begins. Many of these products will be serviced by the initial issuer.

CHAPTER 2 OVERVIEW OF THE DEBT MARKET

The debt market forms the base for many of the products we will be discussing throughout this book. The market actually serves two purposes. The first is that many derivatives products use as a base the underlying issues that trade in this market, such as Treasury debt instruments. The second is that many of the derivatives products discussed in this book trade in the debt markets themselves. Collateralized mortgage obligations are an example. This chapter will focus on the debt instruments operating in that market.

THE GLOBAL ECONOMY

Everyone is connected to the debt market in some way. Individuals and governments both come to the market to borrow funds. On the other side of the equation are the lenders, many of whom are also borrowers. A lender's business model is to borrow other people's money at one interest rate so that it can lend the same money to others at a higher interest rate. Paying an interest rate for the funds that is less than the rate received means a profit. The duration of these borrows ranges from overnight to decades. The additional payment made by the borrower for the use of these funds is referred to as interest. The amount of interest charged by the lenders depends on several factors. The three primary factors are: the availability of funds, the risk that the borrowed sum may not be returned, and the length of time the borrowed funds will be outstanding. Therefore, interest cost can be looked at as another commodity or another product. Since interest rates change and the timing of interest payments to the lender can differ, there is a market to trade interest rates and/or interest payments. If supply of funds exceeds demand for funds, interest rates will fall; whereas, if demand for funds exceeds the supply of funds, interest rates will rise. This symmetry excludes government intervention. The supply of funds is affected by monetary policy and the willingness of lenders, in general, to offer funds. In the global economy, economic events in one part of the planet may cause economic reactions in other parts, which in turn affect not only major corporations' activities but even individuals' daily lives.

Take this simple exercise: Assume a local manufacturer makes a \$5.00 product. The manufacturer buys \$2.00 worth of material per product from a company two towns away, and spends \$2.00 on labor, etc., therefore earning \$1.00 profit for a total revenue source of \$5.00—all of it domestic. Somewhere in some country on another continent is a company that makes the same material, and the domestic manufacturer can acquire the material from this foreign vendor for \$1.25 per product. How long would it be before the manufacturer would switch vendors? The manufacturer would have the ability to see its profit increase from \$1.00 to \$1.75 per unit. If this manufacturer doesn't do it, its competitors will. Let's make it even more realistic by looking at the variables. The manufacturer has to have a factory, which raises a lot of issues. Is the factory owned outright or is there a mortgage? What rate of interest is being paid on the mortgage versus the current rate? Does the manufacturer carry inventory? How is it paid for? Is it pledged against a loan; at what rate is it financed? Does the manufacturer have long-term debt, and if so, what interest rate is being paid? What is the current going rate for this class of debt? Are the bonds callable? Would it be beneficial for the manufacturer to call the debt in and pay for it with new debt at a lower interest cost? Is the company using its funds and resources to its best advantage? These questions, and many more that the company faces every day, assist it to better manage its businesses. As interest is an expense, it chews away at profits. And a company's use of cash, owned or borrowed, is a very dear commodity—perhaps now more than ever.

THE FINANCIAL CRISIS

The financial markets, like any other markets, are vulnerable to abuse. The most recent example is the financial crisis that began late in the last decade. There are many fingers pointing in different directions as to who is to blame. Many people made a lot of money; many more lost. Among the abuses were high-risk loans. It will suffice to say that loans were made to individuals who couldn't afford them, to purchase homes they couldn't afford, at inflated prices the homes couldn't sustain. As the housing market began to cool and housing prices started to fall, homeowners found themselves with outstanding mortgage amounts that exceeded the value of their homes. Many of the homeowners walked away from their obligations. Those houses were eventually sold by the mortgage companies, depressing the housing market even more. On top of this, many "flippers" began buying homes with the intention of dumping them in a few months when homes price rose, capturing the profit. Instead, as the prices were falling, those speculators wound up dumping these investments on an already weak market, causing the prices to fall even faster. Many of these mortgages were securitized into derivative products. By the end of the downward spiral, it was a global disaster. The financial crisis has brought a slew of regulations in the United States under the Dodd-Frank Act, also known as the Wall Street Reform and Consumer Protection Act, many provisions of which are still pending. In addition, the European Central Bank and its seventeen member states found themselves in a sovereign debt crisis with the possibility of countries defaulting, which led to European Market Infrastructure Regulation (EMIR). These regulations are designed to head off another financial crisis. As a law of physics states, each action has a reaction. Many banks and other financial institutions must raise the amount of reserves they are required to keep against their

loans. Therefore the banks have less money to lend, borrowing becomes more difficult, and interest rates rise. The Volcker Rule, which is included in the Dodd-Frank Act, restricts certain financial entities from engaging in different types of proprietary trading, with the result that markets become less liquid. As that happens, traders face bigger risks in their proprietary (market making [trading against the public markets]) activity, and certain markets may become unattractive for trading due to the lack of liquidity and trading activity. In the face of a weak economy, different countries must take care to ensure continuity in the implementation of these actions.

FIXED- VERSUS FLOATING-RATE DEBT INSTRUMENTS

Lenders are always trying to find innovative ways to offer their funds at the highest possible return and yet acquire these funds at a rate that is attractive to the investor or other lending institutions. This search has led to many interesting and complex products. Yet there are still many investors who want straight uncluttered simple debt, such as bonds, notes, and short-term paper (known as commercial paper). These simple instruments pay interest payments periodically, and their principal sum at maturity. However, during the life of the debt instrument, the owners of the issuer's loans are at risk due to no fault of the borrowing entities. If interest rates in general rise, the prices of those fixed-interest instruments already outstanding decrease, in order to remain competitive with the yield of newer products coming to market. Therefore, should the bond owner have to sell these bonds before maturity, and while interest rates are higher than when the bonds were issued, the bond owner would suffer a loss.

Here's an example: As the interest rate is fixed on a bond with a 5 percent "coupon" rate, the bond is expected to pay 5 percent of its principal amount annually. If interest rates in the debt market rise in general so that new bonds coming to market carry a 6 percent coupon, the value of the 5 percent bond has to fall so that its return on investment is comparable to the 6 percent newly issued bonds. The bond is still paying the 5 percent annual interest owed, but it is now priced so that it is yielding the equivalent of the newly issued 6 percent bond. The reverse is true also; if a 5 percent bond is trading in the markets when interest rates fall and newly issued equivalent bonds are carrying a lower interest rate, the price of the 5 percent bond will rise so that its return is competitive. In both cases the bond is paying 5 percent of its face amount, with a \$1,000 bond paying \$50 a year. However, if newly issued bonds, equal in quality and longevity, are trading at their face value but paying out at a different rate due to interest rate changes, the outstanding fixed-income instrument's price must change to remain competitive in the marketplace.

There are investors who value the principal of their investment more than the income it produces. In an attempt to attract these debt investors, wanting not to expose their capital investment to interest rate swings, borrowers will issue floating or adjustable rate instrument bonds. The interest rate paid by these instruments taps into the rates at which short-term debt instruments are borrowing. As short-term rates change, the rate of interest paid on these longer-term bonds is reset periodically to reflect current debt market conditions. As the interest rate paid on newly issued debt rises or falls, the interest rate on these outstanding instruments is adjusted accordingly. It is also important to remember that the real or perceived financial strength of the issuer of the debt also affects the price of its debt instrument.

CALLABLE BONDS

Bonds may contain a call feature: this allows the issuer to retire a bond earlier than the debt's maturity date. Usually a bond with a call feature will contain a premium price at which the bond will be called.

Here's an example: A thirty-year bond has a call feature that allows the bond to be retired (called in) after twenty years, but it may be called at a premium price. The premium will diminish over the ten years that are between the call date and the maturity date of the bond. Furthermore, call features in debt instruments work for the benefit of the issuer, not the investor. An issuer will call bonds in either when it can refinance those loans for less cost, or when it simply does not need the borrowed funds any longer. The former is brought about as general interest rates have fallen and money is easier to borrow. If the issuer can finance the loans for less cost, it means the current bondholder will have the bond called in and then, if desired, reenter the debt market buying other bonds, of equal ratings, that are paying less than the bonds that are being retired. The call feature may permit a full call, the retiring of the entire issue, or a partial call. In the process of the full call, the bonds must be surrendered by the bond owners by a predetermined date. The issuer's agent will pay the bondholders the required amount when the bonds are retired. On the due date of the call, the bond will stop paying interest, and if any bonds are not retired on time, the issuer can continue to use the borrowed funds free of any interest cost until these bonds are submitted for retirement. Bond positions that are maintained by industry institutions for proprietary use or for their clients will deliver the bonds to the issuer's agent by the due date so they can pay the debt owners their due. In the case of a partial call, the main repository, the Depository Trust Company (DTC), will allocate the amount being called among all of their members who have those bonds in position. Those member companies, in turn, will allocate their required portion of the call among their clients' and proprietary accounts that have those bonds in their positions. Therefore there is a chance that a bondholder may have his or her bonds retired early, or have them not retired. Naturally, most bond owners do not want their bonds retired early, as they would miss out on the higher interest income they could receive. Broker-dealers and other financial institutions are under strict rules to carry out their fiduciary responsibility in this allocation process fairly and in accordance with established procedures. On a partial call, the quantity being called may be prorated against those customer accounts holding the bonds. As an investor, it is important that you trust the firm you are doing business with to make sure they are following proper rules and regulations as to the allocation of calls.

The Rule-of-Thumb Method

In dealing with callable bonds, the bond dealer

must offer the bonds to the investor at the lower of yield to maturity or yield to call; whichever is less advantageous to the client. Let's take a look at an example using the rule-of-thumb method; a quick, but inaccurate way of getting near the correct answer. (We'll look at the actual computation for yield to maturity later in the book.) Using the rule of thumb method, a \$1,000 5 percent thirty-year bond is issued that is callable in twenty years at a price of 105 (\$1,050.00). The bond is currently trading at "97" (\$970.00).

Rule-of-Thumb Calculation (ROT)

- Calculate the difference between the market price and the value at maturity, divided by the bond's years remaining. The answer is the annual amortization amount (for a bond priced at a discount) or annual depletion amount (for a bond priced at a premium).
- Add (in the case of a bond trading at a discount) or subtract (in the case of a bond trading at a premium) the amortization/depletion amount to the annual bond's interest payment to get an adjusted payment amount.
- Add the current value and the value at maturity together and divide by two to obtain an average price over the bond's remaining life.
- Divide the adjusted payment amount by the average bond price to get the ROT.

Yield to Maturity

\$30 amortized over 30 years = \$1 per year

Average theoretical value over the life of the bond: = $\$1,000 + \$970 = \$1,970 / 2$ (for average) = \$985

\$5% interest on \$1,000 bond = \$50 + \$1 (annualized amortization) = \$51

$51 / 985 = 5.17\%$

Yield to Call

\$80 amortized over 20 years = \$4

Average theoretical value up to call = $\$1,050 + \$970 = \$2,020 / 2$ (for average) = \$1,010

Annual interest of 5% on \$1,000 bond = \$50 + \$4 (annualized amortization) = \$54

$54 / 1010 = 5.34\%$

Using the above example, the client would be quoted a basis price of 5.17 percent. If the bonds should be called at the twenty-year mark, the client would do better. By using the worst outcome as the quote, the floor is set by which the client can do no worse, but get that return or better. Bear in mind that these yields are obtained through corporate actions and not by market activity. Once the bonds are acquired, selling them in the market will involve profit or loss on the total transaction. This computation has nothing to do with the rate of return on the investment.

Sinking Fund Provision

There are some investors who may, as part of a strategy, want their bonds to be called early, since the normal yield curve slopes upward the longer a debt is outstanding. Let's look at an imaginary investor, Mr. Ian Long, who wants to invest a sum of money for twenty years. Using the chart below, and assuming a straight-line yield curve, Mr. Long could acquire a twenty-year instrument and receive slightly more than a 5 percent rate, or he could buy the thirty-year bond and receive 6 percent interest, hoping to be called at twenty years.

Some bonds are issued with a sinking fund provision to accommodate investors like Mr. Long. This fund allows the issuer to retire the bonds earlier by buying them in the open market and paying for the purchases from the company's earnings. Under the provision of the sinking fund, the issuers are not permitted to pay more than face amount for the bonds. When the sinker is active, participants surrender the bonds to the issuer's agent, which will retire enough of the particular bond issue to satisfy the sinker's provision.

Refunding

Refunding must be looked at from the point of view of the issuer as well as from the point of view of the investor.

Investor's Point of View

The bond issuer exercising a call feature may offer to pay cash for retiring the bonds, or go through a refunding whereby the bondholder is offered a new bond in place of the called one. This refunding applies to the relationship between the investor and issuer. Refunding by the issuer, who is using a new debt to replace the old one, may have incentives for the bondholder to accept the refunding. One such enticement is to issue the new bond with an interest rate below the existing bond's rate, but slightly higher than competitive bonds that are trading in the market. As the bonds are about to be retired, the current bondholders will be receiving cash represented by the call price. The bondholder may reinvest this cash in any product he or she wants to acquire. The most attractive investment may be the issuer's new offering.

Issuer's Point of View

To the issuer who is offering substitute bonds to the current bond holders, they are attempting to refinance the older debt on more favorable terms yet sweetening the offer so as to retain the previous owner's investment. If the issuer is retiring one bond by offering a new bond in the marketplace and not directly to the previous owners, that would be referred to as refunding also. Simply put, the retiring of one debt by issuing another is refunding. The U.S. Treasury Department refunds the Treasury bills every week. They retire Treasury bills that are maturing by paying for them with Treasury bills that are brand new. If they issue more than they retire, they will expand the national debt; if they issue fewer bills than they are retiring, they reduce the national debt. This type of refunding does not include the owners of the older bond. They simply surrender their maturing bonds and receive the payoff proceeds. The new bonds are offered in the market to anyone who wants to acquire them.

PUT BONDS

The term "put bond" is deceiving. It should mean that the bondholders have a right to "put" the bond back to the issuer, given certain terms and conditions. Few bonds are issued with this provision; however, a puttable bond carries a mandate that the bond be returned to the issuer. If the issuer has the right to mandate that the bondholder must put the bonds back to them, that is the same as the call feature of a bond.

Let's look at the call feature more closely. If a corporation comes to market and wants to issue \$10 million worth of thirty-year bonds based on the current interest rate, the company must pay 7 percent. At 7 percent of \$10 million, the bond is paying \$700,000 a year in interest, and over thirty years that will be \$21 million in interest. If interest rates should fall over time, so that this company could now issue a 5 percent bond and the investors would be able to get par, it can now be in a position to issue a \$10 million 5 percent bond. Assuming that one is also going out for thirty years, that will cost the company \$500,000 a year or \$15

million in thirty years. It would save \$6 million by retiring the bond. There is some expense involved in the retiring or reissuance of bonds, of course, but \$6 million saved covers a lot of expenses. Another reason for calling in bonds is the difference in interest rates as the thirty-year bond goes through its life. The thirty-year bond will be paying 7 percent for as long as it's outstanding. After fifteen years, the corporation that issued the thirty-year bond may be able to issue a fifteen-year bond paying less interest, let's assume the proverbial 5 percent. By calling in the thirty-year bond that has fifteen years to go, and issuing a fifteen-year bond that is carrying a 5 percent coupon, the company can save \$3 million a year. Therefore, in the case of a callable bond holder, the threat of a bond's being called is not only caused by a drop of interest rates, it could be caused by a change in the bond's longevity as it goes along the yield curve from thirty years to fifteen years to zero.

SINKING FUND Some bonds are sold with the understanding that a sinking fund has been activated. A sinking fund is the ability of an issuer to buy its bonds back out of earnings. Therefore in the above example, a corporation issuing a thirty-year 7 percent bond, with a sinker in force, can buy the bonds back whenever it wants, depending on the terms of the sinker, and retire the bonds at the current market price. Not all bonds have sinkers. The advantage to buying a bond with a sinking fund is that if the issuer bought back early in the bond's life it will pay as long as it at par or less, and the owner of the bond will receive a high rate of interest for a short period of time—much better than if he or she had invested in a short-term bond. Some bonds are traded at dollar prices, which means they settle in currency. A price in the United States of a bond trading at 96 would be \$0.96 on a dollar, so a \$1,000 bond would cost \$960. A bond trading at 101 would be \$1,010. Bonds that trade below their principal amount are said to be trading at a discount. Bonds that trade above their principal amount are said to trade at a premium. As the interest rates change due to many economic conditions, the price of bonds will change accordingly. In a fixed-income instrument, as interest rates rise bond prices fall; as interest rates fall bond prices rise. Since the bond can't change its interest rate to reflect the current interest rates, it must adjust for the difference somehow.

HOW DEBT INSTRUMENTS TRADE Fixed-income instruments will change their price to accommodate the changing in interest rates. Some debt instruments trade at basis prices. The term "basis price" is short for a yield-to-maturity basis, which means that if the buyer of that particular bond holds the bond to maturity, that is the rate of return they would receive. It includes the interest received, plus any amortization of the difference between the purchase price and par, assuming the bond was procured at a discount, or the depletion of the amount that the customer paid over the bond's face amount if the bond was bought at a premium. Some debt instruments, like municipal securities and U.S. Treasury bills, trade on a yield-to-maturity basis. That means that the price they're paying has to be converted from the yield to maturity or the basis price into a dollar price. Generally speaking, if the basis price is higher than the coupon rate, the bond is trading at a discount. If the yield to maturity is less than the coupon rate, the bond is trading at a premium. For example, if a bond has a 6 percent coupon and is yielding a basis price of 5.9 percent, the customer must be paying more than the face amount to get the reduction in the yield. If that same bond has a basis price of 6.15, the customer would be getting the yield to maturity of 6.15, or 6.15 percent on their money. Since the bond only pays 6 percent interest they must be paying less than par to get the increase in the rate of return. The relationship between the interest rate or coupon rate of the bond and the basis price is very important to understand, especially when discussing credit derivative products. The closer those two are to each other, and the closer the bond is to trading at par, the further the conversion to dollars will be from par. So an 8 percent bond trading at an 8.05 percent yield is trading very close to par. An 8 percent bond trading at 12.5 percent yield basis price is trading far from par and is trading at a deep discount to par.

TAX ON INTEREST PAID Another feature peculiar to bonds is the tax or applicable tax on the interest paid. Concerning United States Treasury bonds, the interest paid is free from state and local taxes, but is taxed by the federal government. It may sound counterintuitive, but once again, the interest paid on debt issued directly by the federal government is taxed by the federal government but not taxed by state and local governments. The interest paid by some municipal bonds is fully taxable, including by federal, state, and local governments; however, the interest paid by most municipal bonds is free from federal tax and, if you live within the state of issuance, free from state and local taxes. Therefore, for people who live in New York City, the city's own municipal bonds are usually free from federal, state, and city taxes. That freedom from federal income tax is applicable across state borders also; however, once you cross the border, the bonds become taxable for state and local purposes. Corporate bonds are fully subject to federal, state, and local taxes. Therefore people who buy tax-free bonds may be getting a small advantage, but the adjustment in the yield between a taxable bond and a tax-free bond normally includes in the calculation the tax rates of those various states. Concerning bonds issued by federal agencies, like Ginnie Mae and Freddie Mac, the interest paid on those bonds is fully taxable on the state, federal, and local levels.

DIFFERENCES BETWEEN MUNICIPAL BONDS AND CORPORATE BONDS An important point to bring out regarding bonds is the issuance. At the point of issuance, U.S. Treasury bonds and corporate bonds have one CUSIP number. Municipal bonds, however, are issued in serial form. Because their various component bonds mature at different times, there are millions of municipal bonds outstanding. Therefore a customer buying your typical corporate bond on Monday, and telling a friend about it that night, might find that friend buying the same bond on Tuesday. However, should that investor have bought a municipal bond on Monday, and told his friend about it on Monday night, chances are that bond would no

longer be available. The corporate bond and the government bond form of issuances is called a "bullet"; which means the entire bond offering has one coupon rate and one maturity date. Municipal bonds, on the other hand, are issued in serial form; therefore, while the issue itself may be as large as a corporate bond, the individual bonds making up the total are relatively or comparatively small and would have their own coupon and maturity date.

CHAPTER 3 TYPES OF RISK IN DEBT MARKETS

One of the main reasons derivatives are used with debt products is to hedge or mitigate the potential risks inherent in debt ownership. These risks emanate from different sources, the product itself, its issuer, the market sector, the market in general, the domestic economy, the global economy, a disaster, or force majeure. Unlike other products, debt products incur liabilities almost at issuance. Any event or happening that may jeopardize the ability of the debt to meet its obligations, now or in the future, constitutes risk. In understanding the credit markets, one must focus on the three core elements that make up risk. Each of these risks in turn affects pricing. There are three primary types of risk in the debt market: credit risk, market risk, and operational risk.

CREDIT RISK

Credit risk is a reflection of the financial strength of the issuer, or the financial strength and marketability that is behind the product itself. There are several tests one might use to determine the creditworthiness of the issuer and/or the issue. One test is how easily the borrower can pay off its debt. Another test is whether, if all of its assets were liquidated at reasonably anticipated prices, the borrower would still face a deficit. Another simple test is to look into how many times over the interest payments are covered by the company's earnings. The true market value of the collateral potentially supporting the instrument can be another test, considering whether the collateral is marketable and fungible. The relative security of the source of funds that will be used to meet the debt obligations is still another. There are many more tests and many different types of analysis that research analysts who work for financial institutions use. Besides these sources are the rating agencies that report on the financial worthiness of the party being studied. Their focus ranges from the workings of Standard Poor's, Moody's, or Fitch, three companies among others that rate government, corporate, and municipal debt, to TransUnion, Experian, and Equifax, which rate individuals' financial status. The ratings given by these agencies affect the borrower's ability to secure funding. Interest rate, or the rate charged for the use of others' money, increases with risk. At certain points certain lenders will not accept the borrower's risk and will not make loans. Therefore, we have terms such as "investment grade" securities, where certain institutions are not permitted to invest in companies whose debt has not achieved this standard rating. A term that was constantly in the news over the last few years was "subprime mortgage loans"; These loans were offered to individuals whose credit scores did not qualify them for a regular loan. These mortgages carried a higher interest rate than a conventional mortgage because the risk of default was much greater. As a debt instrument falls below investment grade, the investment company that is not permitted to own that instrument may have to liquidate and replace it with a better-suited instrument. The need for substitution and the process of doing so can be found in the offering documentation of the product.

Variance in Yield

The rating given to a bond affects its yield. In its simplest form, the yield is an issuer's required annual payout divided by its market price. A \$1,000 bond with a 5 percent "coupon" is supposed to pay \$50 annually. If the bond has a current market value of \$800, its current yield is \$50 divided by \$800 = 6.25 percent. If the bond's current market value is par (face amount, or in this example \$1,000) the current yield would be 5 percent. If the bonds were valued at \$1,250, the current yield would be 4 percent (\$50 divided by \$1,250 = 4 percent). We will discuss bond pricing in the section on market risk. Yield is also affected by credit risk. Two bonds issued by two different companies, on the same day, with the same degree of financial strength backing them, with the same coupon rate and the same maturity date, will probably be trading at slightly different prices. The difference will be due to the market's perception of the issuers. This difference in pricing is reflected in the two bonds' yields and the difference in the prices of one bond to another bond, called the "basis spread"; "Basis points" is a term used to express interest rates, with 100 basis points equaling one percentage point. Therefore, 25 basis points equates to one quarter of a percent and 50 basis points equates to one half of a percent. In the above example of two bonds from different issuers, which have the same characteristics and the same level of securities, let's assume one bond is yielding 5.25 percent while the other is yielding 5.30 percent. It would be said that the bonds would be trading at a 5-basis-point spread. Some debt trades at a trusted rate or bellwether rate, such as LIBOR (London Interbank Offered Rate). If the LIBOR rate is at 3 percent, a debt instrument trading "200 over LIBOR" is priced to yield 5 percent. Bonds at the same ratings may have different yields. This structure is similar to the tiered grading system in schools where grades of 90 to 100 is an A, 80 to 89 is a B, and so on. Taking three students, whose averages are 98, 91, and 88 respectively, and using this logic, a student with a 91-point average would receive the same grade as a student with a 98-point average even though the 91-point average student is closer in grade to a student with an 88-point average. That student would receive a B. Bond yields are more sensitive to their rating. The yield on the 91 average bond would be priced closer to the 88 average bond than it would be to the 98 average bond.

Bond Ratings