

SECTION

One**Derivatives and Their Markets**

A derivative is a contract between two parties that provides for a payoff from one party to the other based on the performance of an underlying asset, currency, or interest rate. The payoff of the derivative is said to be “derived” from the performance of something else, which is often called the underlying asset or just the “underlying.” As noted all derivatives have two parties, who are typically known as the “buyer” and “seller” or sometimes the “long” and “short.” The short is even sometimes referred to as the “writer.” Derivatives almost always have a defined life. That is, they typically expire on a specific date. The payments made on a derivative are sometimes made partially at the start, sometimes made during the life of the derivative, and sometime made at the expiration. Some derivatives can be terminated early. Some derivatives have their payoffs made in cash and some have their payoffs made in the underlying or even in another asset. Derivative contracts can be informally negotiated between two parties or can be created on a derivatives exchange. Some types of derivatives are regulated and others are essentially unregulated.

The four basic types of derivatives are forward contracts, futures contracts, options, and swaps. Other types of derivatives can be created by blending some of these derivatives with the underlying. Some people also refer to asset-backed securities as derivatives and we will cover these in this book.

Understanding derivatives requires an understanding of what their payoffs would be given the payoff of the underlying. Options, for example, pay

off either a given amount of money that is determined by the underlying or they pay off nothing. Forwards, futures, and swaps on the other hand almost always pay off something. Their payoffs are driven nearly one-for-one by what the underlying does. Understanding derivatives also requires an appreciation for the circumstances under which a derivative would be appropriately used. That is, why would someone use a derivative and if they would, why would they use one type of derivative instead of another? Finally and perhaps most importantly, understanding derivatives requires an understanding of how they are priced. If you pay \$5 for an option on a stock or enter into an interest rate swap promising to pay a fixed rate of 6%, why \$5 and 6%?

Grasping the basic ideas behind derivatives is not too difficult. I predict that you will have little trouble understanding the four basic types of derivatives and will know the kinds of situations in which one might be used and preferred over another. The hardest part is indeed understanding the pricing. All of this material is covered in this book. We work you up to it slowly and (hopefully) painlessly.

This first section covers the basics. Essay 1 describes how the derivatives markets are organized. The second essay is an update of paper I wrote years ago on the history of derivatives markets that proved to be very popular. It takes you from ancient times to today. The third essay explains why derivatives exist and what they are used for. Essays 4–6 introduce the four basic types of derivatives. Essay 7 then explains the types of risks that these instruments are designed to protect against.

ESSAY 1

The Structure of Derivative Markets

It has been said in the past that derivatives are kind of a sideshow, where the main event takes place in the money and capital markets. You could attend the sideshow without taking part in the main event and vice versa. With respect to derivative and money/capital markets, that is simply not true today. Derivatives are so widely used that even if you have no intention of using them, it is important to understand how they are used by others and what effects, positive and negative, they could have on money and capital markets.

As you probably know, the money market consists of the over-the-counter markets for various short-term securities, such as Treasury bills, bank certificates of deposit, and commercial paper. The capital market consists of organized stock exchanges, such as the New York Stock Exchange, the American Stock Exchange, the Philadelphia Stock Exchange, and the Midwest Stock Exchange, to name a few. In addition there is the well-known National Association of Securities Dealers, otherwise known as Nasdaq, which is the principal over-the-counter market for securities. A small amount of corporate bond trading occurs on the New York Stock Exchange and the American Stock Exchange. By far, however, the preponderance of corporate bonds and all government bonds and asset-backed securities trade on the over-the-counter markets, which are simply dealers who stand willing to trade on either side of the market.

From around the middle nineteenth century until around 1990, it was probably correct to say that the center of the derivatives industry was Chicago. This belief from 1973 on, was due to the futures trading at the Chicago Mercantile Exchange and the Chicago Board of Trade and, the options trading at the Chicago Board Options Exchange. From the early 1990s on, however, the explosive growth in the global markets for swaps and other over-the-counter derivatives created new centers in New York,

London, and Tokyo. The over-the-counter derivatives market is quite simply any firm willing to do either side of a derivatives transaction. These dealers stand ready to buy and sell derivatives with a spread between their bid and ask prices. By hedging their remaining exposure, they would, with sufficient volume, generate a profit. The competition in this market grew, however, reducing profit margins to paper thin, but few players exited the market. Today it remains a large and active market.

On the other side of derivatives transactions are the parties called *end users*. These are primarily corporations that face certain types of risks. For example, firms engaged in multinational business nearly always have foreign exchange risk. Firms that use various commodities as raw materials, such as airlines using jet fuel, face exposure to price changes. Virtually all firms borrow money and are thus exposed to the risk of interest rate changes. Most end users are corporations hedging one or more of these types of risks. A typical corporation does not use derivatives heavily but selectively chooses to hedge a particular risk with which it feels uncomfortable. Such transactions typically come out of the corporation's treasury department. Some corporate treasurers, however, engage in speculative trading, sometimes due to pressure to make money or reduce costs by trading. We will hear this point again in Essay 72.

In addition, investment managers face interest rate risk, foreign exchange risk, and the risk of stock price movements. Although investment managers are much more in the business of dealing with financial market risks than are corporate treasurers, derivatives are more widely used in the corporate world than in the investment world. This point is probably true because so many investment managers are either pension fund or mutual fund managers whose charters restrict their use of certain types of instruments like derivatives and require them to adhere to well-accepted fiduciary guidelines. Corporations, however, have far fewer restrictions placed on them by their shareholders and are not considered fiduciaries in the sense that a pension fund manager is.

Some state, local, and foreign governments are also active users of derivatives. The United States government, however, does not directly engage in derivative transactions. Some of its agencies, such as the Postal Service, have used derivatives. In addition the U.S. government at one time issued callable bonds, which are ordinary bonds with an embedded derivative.

The derivatives industry also consists of software and consulting firms. The financial software industry has grown rapidly from a few small firms to at least 50 firms, but in recent years has consolidated through mergers and acquisitions. Consulting firms perform studies and give advice on firms' derivatives operations, typically with an eye toward ensuring that adequate controls are in place. When problems occur, consulting firms often assist

firms in sorting out the problems and dealing with the fallout. In some cases these consulting firms are well-known public accounting firms.

Finally, whenever an industry grows as rapidly as has the derivatives industry, combined with the fact that the amounts of money at stake are large, a concomitant growth in the number of lawyers and law firms involved in derivative transactions can be expected. In the early stages of the growth of the exchange-listed derivatives industry, law firms primarily dealt with the occasional law suits between clients and brokers. As the over-the-counter industry grew, the legal aspects of derivatives came to include the importance of proper documentation of each contract. Lawyers were increasingly called on to assist those organizations experiencing derivatives losses in transactions with dealers to sue the dealers, claiming that they were misled and that they had viewed the dealers as advisors and not adversaries. And while all derivatives dealers have their own legal staff, most use outside attorneys to defend themselves when they are sued. Today derivatives attorneys continue to do this kind of work but also perform more due diligence and compliance work, meaning that they attempt to prevent legal problems before they occur rather than deal with them afterward.

Thus, we see that the derivatives industry has a diverse group of participants. It is a dynamic and exciting industry that has grown rapidly but still has much potential for becoming even larger and more diverse.

TEST YOUR KNOWLEDGE

1. Explain the difference between a dealer and an end user.
2. Why are derivatives used more by corporations than by investment funds?
3. How does the U.S. government use derivatives?

