1 Option History, Definitions, and Terms

There are many types of listed options trading today: stock options, index options, and futures options are the major ones. The object of this book is to explore some of the many ways in which options can be used and to give practical demonstrations that will help the reader make money.

Options are useful in a wide array of applications. They can be used to establish self-contained strategies, they can be used as substitutes for other instruments, or they can be used to enhance or protect one's position in the underlying instrument, whether that is stock, index, or futures. In the course of this book, the reader may discover that there are more useful applications of options than he ever imagined. As stated in the Preface, this book is not really meant for novices but contains all definitions to serve as a platform for the larger discussion.

UNDERLYING INSTRUMENTS

Let's begin with the definitions of the simplest terms, as a means of establishing the basic building blocks. Before even getting into what an option *is*, we should have some idea of the kinds of things that have options. That is, what are the underlying instruments that provide the groundwork for the various listed derivative securities (options, warrants, etc.)? The simplest underlying instrument is common stock. Options that give the investor the right to buy or sell common stock are called *stock options* or *equity options*.

Another very popular type of underlying instrument is an *index*. An index is created when prices of a group of financial instruments—stocks, for example—are grouped together and "averaged" in some manner so that the resulting number is an index that supposedly is representative of how that particular group of financial instruments is performing. The best-known index is the Dow Jones Industrial Average, but there are indices of many other groups of stocks; indices with a large number of stocks in them are the Standard & Poor's (S&P) 500 and the Value Line Index, for example. There are also many stock indices that track various groups of stocks that are in the same industry: Utility Index, Oil Index, Gold and Silver Index, for example. There are even indices on foreign stock markets, but they have options listed in the United States; these include the Japan Index, Hong Kong Index, and Mexico Index, as well as several others. Indices are not restricted to stocks, however. There are indices of commodities, such as the Commodity Research Bureau Index. Moreover, there are indices of bonds and rates; these include such things as the Short-Term Rate Index, the Muni Bond Index, and the 30-Year Bond Rate Index. Options on these indices are called *index options*. Appendix A contains a list of available index options.

Finally, the third broad category of underlying instrument is *futures*. This is probably the least-understood type of underlying instrument, but as you will see when we get into strategies, futures options are extremely useful and very important. Some people mistakenly think options and futures are nearly the same thing. Nothing could be further from the truth. The "dry" definition is *a futures contract is a standardized contract calling for the delivery of a specified quantity of a certain commodity, or delivery of cash, at some future time*. In reality, owning a futures contract is very much like owning stock, except that the futures' price is related to the cash price of the underlying commodity, and the futures contract has a fixed expiration date. Thus, futures contracts can climb in price infinitely, just as stocks can, and they could theoretically trade all the way down to zero, just as stocks can. Moreover, futures can generally be traded on very small percentages of margin, so that the risk of owning futures is quite large, as are the potential rewards. We discuss futures contracts in more detail later, but this brief description should suffice to lay the groundwork for the following discussion of options

terms. As might be suspected, options on futures contracts are called *futures options*.

OPTION TERMS

An *option* is the right to buy or sell a particular underlying security at a specific price, and that right is only good for a certain period of time. The specific items in that definition of an option are as follows:

- ***Type.*** Type describes whether we are talking about a call option or a put option. If we are talking about stock options, then a call option gives its owner the right to *buy* stock, while a put option gives him the right to *sell* stock. While it is possible to use options in many ways, if we are merely talking about buying options, then a call option purchase is bullish—we want the underlying stock to increase in price—and a put option purchase is bearish—we want the stock to decline.
- ***Underlying Security.*** Underlying security is what *specifically* can be bought or sold by the option holder. In the case of stock options, it's the actual stock that can be bought or sold (IBM, for example).
- ***Strike Price.*** The strike price is the price at which the underlying security can be bought (call option) or sold (put option). Listed options have some standardization as far as striking prices are concerned. For example, stock and index options have striking prices spaced 5 points apart. Moreover stock options also have strikes spaced 2½ points apart if the strike is below 25. Futures option striking prices are more complex, because of the differing natures of the underlying futures, but they are still standardized for each commodity (1 point apart for bonds, for example, or 10 points apart for a more volatile commodity, like corn).
- ***Expiration Date.*** The expiration date is the date by which the option must either be liquidated (i.e., sold in the open market) or exercised (i.e., converted into the physical instrument that underlies the option contract—stock, index, or

futures). Again, expiration dates were standardized with the listing of options on exchanges. For stock options and most index options, this date is the Saturday following the third Friday of the expiration month (which, by default, makes the third Friday of the month the last trading day). However, for futures options, these dates vary widely. More about that later. The most heavily traded listed options usually have less than nine months of life remaining, but there are longer-term options—called LEAPS options when one is referring to stock options or index options—that can extend out to two years or more.

These four terms combine to uniquely describe any option contract. It is common to describe the option by stating these terms in this order: underlying, expiration date, strike, and type. For example, an option described as an *IBM July 50 call* completely describes the fact that this option gives you the right to buy IBM at a price of 50, up until the expiration date in July. Similarly, a futures option described as the *U.S. Bond Dec 98 put* gives you the right to sell the underlying 30-year U.S. Government Bond futures contract at a price of 98, up until the expiration of the December options.

THE COST OF AN OPTION

The cost of an option is, of course, called the *price*, but it is also referred to as the *premium*. You may notice that we have not yet described *how much* of the underlying instrument can be bought or sold via the option contract. Listed options generally standardize this quantity. For example, stock options give the owner the right to buy (call) or sell (put) 100 shares of the underlying stock. If the stock splits or declares a stock dividend, then that quantity is adjusted to reflect the split. But, in general, stock options are spoken of as being options on 100 shares of stock. Index options, too, are generally for 100 "shares" of the underlying index; but since the index is not usually a physical entity (i.e., it does not really have *shares*), index options often convert into cash. We will describe that process shortly. Finally, futures options are exercisable into *one* futures con-

tract, regardless of how many bushels, pounds, bales, or bonds that futures contract represents in terms of the actual commodity.

Only by knowing this quantity can you tell how many actual dollars an option contract will cost, since option prices are quoted in units. For example, if someone tells you that the IBM July 50 call is trading at 3 (and we know that the option is for 100 shares of IBM), then the actual cost of the option is $300. Thus, one option trading at 3 costs $300 and "controls" 100 shares of IBM until the expiration date.

It is a fairly common mistake for a beginner to say "I want to buy 100 options" when what he really means is he wants to buy one option (this mistake derives from the fact that if a stock investor wants to control 100 shares of IBM, then he tells his broker to buy 100 IBM common stock). This can result in some big errors for customers and/or their brokerage firms, or possibly even worse. You can see that if you told your broker to buy 500 of the above IBM options, you would have to pay $150,000 for those options (500 × $300); but if you really meant to buy 5 options (to "control" 500 shares of IBM), you thought you were making a $1,500 investment (5 × $300). Quite a difference.

Of course, these sorts of things tend to balloon out of control at the worst times (Murphy's Law is what they call it). When the market crashed 190 points on one Friday in October 1990 as the UAL deal fell apart, people were genuinely concerned. On Monday morning, a rather large stockholder had been reading about buying puts as protection for his stocks, so he put in a market order to buy something like 1,500 puts at the market. His broker was a little taken aback, but since this was a large stockholder, he put the order in. Of course, that morning, the puts were extremely expensive as people were fearful of another 1987–style crash. Even though the options had been quoted at a price of 5 on Friday night, the order was filled on Monday morning at the extremely high price of 12 because of fear that prices would crash further. Two days later, the customer received his confirm, requesting payment of $1.8 million. The customer called his broker and said that he had meant to buy puts on 1,500 shares, not 1,500 puts—a difference of roughly $1,782,000! Of course, by this time, the market had rallied and the puts were trading at only a dollar or two (one or two points, that is). I'm not sure how the lawsuit turned out.

The cost—in U.S. dollars—of any particular futures option depends, of course, on how much of the commodity the futures control. We have already said that a futures option "controls" one futures contract. But each futures contract is somewhat different. For example, soybean futures and options are worth $50 per point. So if someone says that a soybean July 600 put is selling for 12, then it would cost $600 (12 × $50) to buy that option. However, Eurodollar futures and options are worth $2,500 per point. So if a Eurodollar Dec 98 call is selling for 0.70, then you have to pay $1,750 (0.70 × $2,500) to buy it. We specify the terms for most of the larger futures contracts in Appendix B.

THE HISTORY OF LISTED OPTIONS

On April 26, 1973, the Chicago Board Options Exchange (CBOE) opened its doors and began trading listed call options on 16 stocks. From that humble beginning, option trading has evolved to today's broad and active markets. We thought it might be interesting to review how option trading got to where it is today (*nostalgic* might be a better word for "old-timers" who have been around since the beginning). In addition, a review of the history of listed option trading might provide some insight for newer traders as to how and why the markets have developed the way they have.

The Over-the-Counter Market

Prior to listed option trading, puts and calls traded over the counter. In this form, there were several dealers of options who found both a buyer and a seller (writer) of a contract, got them to agree on terms, and executed a trade between them. The term *writer* arose from the fact that an actual contract was being "written" and the issuing party was the seller of the option. The dealer generally took a commission out of the middle of this trade: for example, the buyer might have paid 3¼ and the seller received 3. The remaining ¼ point was kept by the dealer as payment for lining up the trade.

Options of this type were generally struck at the current stock price; thus if the stock was selling at 46⅜ when the contract was agreed upon, then that would be the striking price of the calls (or puts). This made for some very awkward calculations. Moreover, these over-the-counter options normally had expiration dates that were fixed time periods when they were issued: the choices were time periods of 6 months + 10 days, 95 days, 65 days, or 35 days. One other term that was unusual: dividends went to the holder of the call upon exercise. Thus, upon exercise, the striking price would actually be adjusted for the dividends paid over the life of the option.

Besides the relatively arduous task of finding two parties who wanted to take opposite sides of a particular trade, the greatest hindrance to development of the over-the-counter market was that there was virtually no secondary market at all. Suppose you bought a call on a stock with these terms: strike price 46⅜, expiration date 35 days from trade date. Later, if the stock went up a couple of points quickly, you might theoretically have wanted to sell your over-the-counter call. However, who were you going to sell it to? The dealer might try to find another buyer, but the terms would be the same as the original call. Thus, if the stock had risen to 48¾ after 10 calendar days had passed, the dealer would be trying to find someone to buy a call that was 2⅜ points in-the-money that had 25 days of life remaining. Needless to say, it would be virtually impossible for a buyer to be found. Thus, option holders were often forced to hold on until expiration or to trade stock against their option in order to lock in some profit. Since this was in the days of fixed commission rates, it was a relatively expensive matter to be trading stock against an option holding. Altogether, this was a small option market, trading less than 1,000 contracts daily in total.

The CBOE Beginning

This over-the-counter arrangement was onerous for all parties. So it was decided to put into practice the idea of standardizing things by having fixed striking prices and fixed expiration dates, and having all trades clear through a central clearing corporation. These solutions all came from the Chicago Board of Trade (CBOT), since standard-

ization of futures contracts had proven to be workable there. The first president of the CBOE was Joe Sullivan, who had headed the research project for the CBOT.

However, since over-the-counter option trading was "the way it had always been," the idea of standardizing things was met with heavy skepticism. The extent of this skepticism was most evident in one interesting story: the major over-the-counter dealers were offered seats on the fledgling CBOE for the nominal cost of $10,000 apiece. A seat today is worth over $450,000. Few of them took the opportunity to buy those seats for what turned out to be a paltry amount; many were convinced that the new exchange was little more than a joke. In addition, since these new options were traded on an exchange, the Securities and Exchange Commission (SEC) had to approve them and issue regulations.

Nevertheless, the Chicago Board Options Exchange opened its doors on April 26, 1973, with first-day volume of 911 calls being traded on 16 stocks. Surprisingly—and even some traders who were around at the beginning may find this hard to remember—IBM was not one of the original 16. It was listed in the second group of 16 stocks, which were added in the fall of 1973. Given the fact that IBM has been, by far, the most active equity option stock, it is hard to remember that it wasn't one of the originals. In fact, the original group was a rather odd array of stocks. If you were around at the beginning, test your memory. How many of them can you remember? They are listed three paragraphs below.

Besides standardizing the terms of options, the CBOE introduced the market maker system to listed equity markets and also was responsible for the Option Clearing Corporation (OCC), the guarantor of all options trades. Both of these concepts were important in giving the new exchange viability from the viewpoints of depth of markets and reliability of the exercise process. If you exercised your call, the OCC stood ready to make delivery even if the writer of the call somehow defaulted (margin rules, of course, generally prevented such a default, but the existence of the OCC was an important concept).

The second group of 16 stocks that were listed contained some of the most active traders over the years, in addition to IBM: RCA, Avon, Exxon, Kerr-McGee, Kresge (now K-Mart), and Sears, to name a few. Another group of eight stocks was added in November 1974,

and the growth of the listed option market was off and running. The American Stock Exchange (AMEX) listed options in January 1975, while the Philadelphia Stock Exchange added their options in June 1975. Furthermore, the success of this listed market eventually spurred the listing of futures options that we have today (agricultural options trading had been banned since the 1920s due to excesses within the industry, and there was no such thing as a financial future at the time). The continued issuance of new products—such as index futures and options, exchange-traded funds (ETFs), and financial futures—and the subsequent growth and revitalization of the exchanges that listed them can be traced to the success of the CBOE. The old over-the-counter market was virtually eliminated, except for options on stocks that weren't listed on the option exchanges.

The original 16 stocks whose options were initially listed on the CBOE were: AT&T, Atlantic Richfield, Brunswick, Eastman Kodak, Ford, Gulf & Western, Loews, McDonald's, Merck, Northwest Airlines, Pennzoil, Polaroid, Sperry Rand, Texas Instruments, Upjohn, and Xerox.

Index Options

The next large innovation in the equity markets was the introduction of index trading. This historic type of trading began when the Kansas City Board of Trade listed futures on the Value Line Index in 1982. The CBOE invented the OEX index (composed of 100 fairly large stocks, all of which had options listed on the CBOE) and listed the first index options on it on March 11, 1983. Today the OEX index is known as the Standard & Poor's 100 Index, but it still trades with the symbol "OEX." This has been one of the most successful equity or index option products ever listed. Meanwhile, the Chicago Mercantile Exchange (Merc) started trading in S&P 500 futures, whose success and power extended far beyond the arena of futures and option trading—eventually becoming the "king" of all index trading and subsequently being the instrument that was blamed for the crash of 1987 and numerous other nervous days in the market.

The reason that these index products were so successful was that for the first time it was possible for an investor to have a view on the

market itself and to be able to act on that view directly. Prior to the existence of index products, the investor—whether an individual or a large institutional money manager—had to implement his market view by buying stock. As we all know, it is often possible to be right on the market but to be wrong on a particular stock. Being able to trade indices directly took care of that problem.

Exchange-Traded Funds

In the 1990s, a new concept was introduced—the exchange-traded fund. These are merely groups of stocks with a common trait—oil stocks, for example—that are created by large institutions. The resulting ETF is actually listed and traded on the New York Stock Exchange (NYSE) or the AMEX. Thus investors can actually buy an index, where these are listed. Some other similar products have been listed as well. These are unit trusts or depository trusts. Again, a group of stocks is bundled together, and the resulting unit trust is listed and traded on an exchange. In many cases, options are traded on these entities as well.

The most popular and liquid of these products are the SPDRS (S&P 500 Depository Receipts), which are equal to one-tenth the value of the S&P 500 Index itself, and the Nasdaq 100 Tracking Stock (QQQ). However, there are now literally hundreds of these, many of which are called iShares, originally created by Barclays Global Investors to track all manner of indices.

Many institutional and private investors who prefer passive management (an index fund) and diversity are trading these various ETFs. They allow investors to seek out the sectors they desire and to trade them simply and directly, without having to buy several stocks deemed representative of the sector.

Futures Options

The initial listing of financial futures contracts depends on how you define financial futures. If you include currencies, then the 1972 listing of currency futures on the Chicago Merc marked the beginning.

If, however, you mean interest rate futures, the initial listing was U.S. Government National Mortgage Association (GNMA) futures on the CBOT in 1975. U.S. Treasury Bill (T-bill) futures followed in 1976. However, the most popular contracts, the 30-year U.S. Bond contract and the Eurodollar futures were listed in 1977 and 1981, respectively. Options on these products didn't appear until several years after the futures were listed (1982 for the bonds, 1986 for Eurodollars). The first agricultural options were listed on soybeans in 1984.

Today's Over-the-Counter Market

According to the CBOE, there are several hundred million option contracts traded annually in the United States today. There are, of course, many foreign exchanges that trade listed options as well, having patterned themselves after the success of the U.S. markets. Ironically, there is a large volume of option contracts trading that is not counted in these figures, for there is an active over-the-counter market in derivative products again today!

We seem to have come full circle. While today's over-the-counter market is much more sophisticated than its predecessor, it has certain similarities. The greatest similarity is that contracts are not standardized. Today's large institutions that utilize options prefer to have them customized to their portfolios and positions (for it is unlikely that they own the exact composition of the S&P 500 or the S&P 100 and therefore can't hedge completely with futures and options on those listed products); moreover, they may want expiration dates that are other than the standard ones.

A very large difference between the over-the-counter market of today and yesteryear is that the contracts today are generally issued by the larger securities firms (Salomon Brothers, Morgan Stanley, Goldman Sachs, etc.). These firms then employ strategists and traders to hedge their resulting portfolio. This is a far cry from the old days where the brokerage firm merely located both a buyer and a seller and got them together for the option transaction. If history repeats itself, the exchanges will make attempts to move the current over-the-counter trading onto the listed marketplace. The CBOE has

already listed FLEX options (which allow for varying expiration dates and striking prices) as the beginning of the inroad into this market.

Thus, option strategies and option trading are an ever-evolving story. Those who make the effort to understand and use options will certainly have more alternatives available to themselves than those who don't.

OPTION TRADING PROCEDURES

Listed options can be bought and sold whenever the exchange is open. This is the biggest advantage to trading listed options (as opposed to trading the older style over-the-counter options), and it is the reason why the option exchanges have enjoyed their success. Thus, if you buy an option in the morning, expecting the market to go higher, but then change your mind in the afternoon, you are perfectly free to go back into the market and sell your option.

The concepts of open interest are familiar to futures traders, but not necessarily to stock traders. When a trader first transacts a particular option in his account, he is said to be executing an *opening trade*. This is true whether he initially buys or sells the option. Such a trade adds to the *open interest* of that particular option series. Later, when he executes a trade that removes the option from his account, he is said to be executing a *closing trade*. A closing trade decreases the open interest. Some technicians keep an eye on open interest as a possible predictor of futures price movements by the underlying security. The reason that we mention this is that you must specify whether the trade is opening or closing when you place an option order.

An option order must specify the following seven items:

1. Buy or sell.
2. Quantity.
3. The description of the option (e.g., IBM July 50 call).
4. Price.
5. Type of order (see the next paragraph).
6. Whether the trade is opening or closing.
7. Whether the account is "customer" or "firm."

Order types (item 5) for options are just like they are for stocks or futures. You can use *market orders* (dangerous in illiquid options), *limit orders* (probably a good idea most of the time), *stop orders* (not a good idea with options), and *good-until-canceled orders*. If you are trading directly through professional traders on the floor, you will probably want to use *market not held* orders (which gives the broker in the crowd the ability to make a decision of his own, for your account). Only use "market not held" if you know the floor broker and trust his judgment; it is not a good idea to use this type of order if you're entering your order through one of the large brokerage firms (they probably wouldn't accept a "not held" order anyway). Other, more exotic order types, such as *market on close*, are not available for most options, but you can always check with your broker to be sure.

Regarding item 6, if you don't know the difference between "customer" and "firm," then you're a "customer." For the record, a firm trader is one who is trading the account of a member of the exchange (these are professional traders, many of whom trade from trading desks—you don't necessarily have to be on the trading floor in order to trade for a member firm's own account). A customer is everyone else—all the traders who are not members of the exchange or trading for the account of an exchange member. This distinction is placed on the order because a "customer" order has priority over a "firm" order in many situations on the trading floor.

A typical option order, then, might be "Buy 5 IBM July 50 calls at 3, open customer"; or if you are trading through a brokerage firm, they will assume you are a customer, so you might need only to say "Buy 5 IBM July 50 calls at 3 to open." In either case, this is a limit order because you have specified a price, indicating that you are not willing to pay more than 3 for this option. If you are trading in a very liquid option (the most liquid options are IBM for stocks, QQQ for Indices, and Eurodollars for futures), you might use a market order: "Buy 10 Eurodollar Dec 98 calls at the market to open." If you get in the habit of stating your orders correctly and making your broker (or floor trader) repeat them back to you, you will eliminate almost all mistakes, or "errors" as they are officially called. I'd bet that more than 75 percent of all errors are caused by confusing buy and sell: the person stating the order says buy, but the person

writing it down on the other end of the phone circles "sell" on the order ticket for some reason; sometimes, even if it's repeated back, the person giving the order isn't listening too carefully and the order goes in incorrectly.

One of the most embarrassing errors in history didn't involve options. In 1994, Bell Atlantic and Telecommunications Inc., a large cable TV operator, announced a merger that would have been very beneficial to Telecommunications Inc.'s stock price. The stock symbol for Telecommunications Inc. is TCOMA (its class A stock is the primary trading vehicle), but among "techies" the stock is known as TCI (this is something akin to Texas Instruments being known as TI to all the research labs guys, but its stock symbol is TXN). Well, as you might guess, the television financial news reporters—who often like to appear as if they are one of the "inside" guys—repeatedly stated that Bell Atlantic was buying TCI. As it turns out, there is a stock whose symbol is TCI—Transcontinental Realty Inc., a real estate investment trust, or REIT! Transcontinental Realty was up 3 points in fairly heavy trading before people started to realize their mistake. As soon as they did, it collapsed back to where it was. I have yet to meet anyone who actually admits that they bought TCI when they should have bought TCOMA, but they're out there somewhere, and some of them are probably "professional" arbs (or were).

The point is that each aspect of a trade should be handled in a professional manner—state the order properly, demand that it be repeated back, listen to the repeat. That's all you can do; if an order clerk subsequently types the wrong information into a computer or mistakenly circles the wrong information on the floor ticket, you can't control that. But you can demand that restitution be made if you handle your end of things correctly. Most brokerage firm office managers have no problem refunding a customer the amount of an error that is clearly the brokerage firm's fault—you just don't want to be in the gray area, where there is some dispute over what was said and never repeated.

ELECTRONIC TRADING

Today, many traders use electronic platforms to place their (option) trades. The same items must be specified as when placing your order over the phone, although the computer software handling your trade

may be smart enough to tell whether you are opening or closing the position—and it won't ask if you're "firm" or "customer" because it will already know that. An electronic order entry screen will normally show you your order before you send it to the floor. This is your chance to check for errors (similar to asking the phone clerk or broker to repeat the order back to you, if you are using humans in your order entry process). Do not get in the habit of automatically clicking on "OK" without rereading the particulars of your order. Any errors that occur are necessarily *yours* because there are no other people involved in the order entry process.

Later on in the process, it may turn out that a computer malfunction at either your electronic brokerage firm or on the trading floor kept you from getting the execution you thought you were entitled to. This is not an "order entry error" and may be correctable, but you would have to talk to some humans at your electronic brokerage firm in order to sort out what, if any, compensation you deserve.

EXERCISE AND ASSIGNMENT

An option is said to have *intrinsic value* when the stock price is above the strike price of a call or below the strike price of a put. Another term that describes the situation where an option has intrinsic value is to say that the option is *in-the-money*. If the option has no intrinsic value, it is said to be *out-of-the-money*. For calls, this would mean that the underlying's price is currently *below* the striking price of the call; and for puts, it would mean that the underlying's price is *above* the strike price of the put.

Another related definition that is important is that of *parity*. Any derivative security that is trading with no time value premium is said to be trading *at parity*. Sometimes parity is used as a sort of measuring stick. One may say that an option is trading at a half-point or a quarter-point above parity.

Example: XYZ is 53.

July 40 call: 12¾	¼ point below parity
July 45 call: 8	At parity
July 50 call: 3¼	¼ point above parity

Ultimately, one of two things happens to an option as it reaches expiration: (1) it is exercised or (2) it expires worthless. The owner (also called the *holder*) of an out-of-the-money option will let it expire worthless. This is any call where the stock, index, or futures price is *below* the strike price at expiration. In the same manner, he will let a put expire worthless if the underlying price is *higher* than the strike price at expiration. For example, if one owned the IBM July 50 call and IBM was trading at 45 at expiration, why would you want to exercise your call to buy 100 shares of IBM at 50 when you can just go to the stock market and buy 100 shares of IBM for 45? You wouldn't, of course. Believe it or not, though, in the early days of option trading, things like that did happen occasionally.

In the movie *Brewster's Millions*, starring Richard Pryor, a minor league baseball player stands to inherit a large amount of money—something like $300 million—providing that he fulfill the terms of a rather crazy will: he must spend (or lose) something like $30 million in a short period of time. Of course, he goes through all kinds of crazy maneuvers to barely accomplish his appointed task by the given date. It's an intriguing movie, as it gets you thinking about how much money you could spend quickly. I've often thought that he could have simplified his life considerably by just buying some options that were about to expire, whose strike price was way above the current market price, and exercising them. He could have squandered the $30 million in an instant!

Of course, if the option is in-the-money—that is, the price of the underlying is higher than the strike price of a call—then the owner of the call will exercise it because it has value. In an example similar to the previous one, if you own the IBM July 50 call and IBM is selling at 55, then you would exercise the call because you can buy IBM at 50 via your call exercise, whereas you would have to pay 55 to buy IBM in the open market. Conversely, a put holder would exercise his put if it is in-the-money—that is, if the underlying's current price were below the strike price—because the put gives him the right to sell at the higher price, the strike.

At the end of an option's life, there is a good chance that it ends up in the hands of a market maker, or other "firm" trader, if it has intrinsic value. This is because most "customers" sell their options in

the open market rather than exercise them. They do this for two reasons: (1) they are required to come up with substantially more cash to buy the stock than it takes to buy the option, and (2) the commission on one option trade is smaller than two stock trades (if you exercise a call and buy stock, for example, you're going to have to sell the stock someday and pay another commission). Firm traders don't pay commissions (so that's why those seats cost so much!), and as expiration nears, they buy options from customers who are selling them in closing transactions. There is nothing particularly good or bad about this phenomenon, it's just the most efficient way for everybody to act as expiration approaches. The firm traders then exercise the options at expiration; they are not as concerned about capital requirements as most customers would be. In all probability, the firm traders have already "squared up" their positions by the time they exercise, so they don't end up being long or short much stock or futures at all.

Many people have heard and even repeated the statement that "90 percent of all options expire worthless." It's unclear where that got started—some say from a study done back in the 1940s regarding the illiquid over-the-counter market at that time. This statement is patent nonsense with respect to listed options, and one only has to think about it to realize the fact. Consider this scenario: when options are initially listed, they have striking prices that surround the current price of the underlying (if IBM is trading at 50, then there will be strikes of 40, 45, 50, 55, and 60, etc.). Now, puts and calls are traded at all strikes—not necessarily in equal quantities, but there will be some open interest in all series. As the stock fluctuates during the life of the options, various strikes will become more liquid as IBM's stock price nears that particular strike. As a result, open interest will build up at various strikes.

By expiration, if IBM has risen in price, nearly all the calls will be in-the-money and therefore will *not* be worthless; if IBM falls in price, nearly all the puts will be in-the-money at expiration. Since options are listed at least nine months in advance of expiration, there is a significant chance that the stock or futures contract will have a serious price change by the time expiration rolls around. In either case, I can assure you that far less than 90 percent of the options are expiring worthless.

Statistics have been kept by the CBOE since options first started trading in 1973, and they show that only 30 percent of equity options expire worthless. The CBOE says that this figure is rather consistent, expiration after expiration, year after year. Not that the CBOE's data would need verification, but we have kept similar statistics at our own firm, McMillan Analysis Corp., since 1998, and our figures match up quite well with the CBOE's. What we have done is to look at the closing bid and offer of all equity options on the last day of trading. If the option has a bid of 60 cents or more, we declare it to "have value." Since 1998, on average, approximately 58 percent of all options "have value" at expiration, based on open interest. The CBOE further claims that about 10 percent of all options are closed out prior to expiration in transactions where both parties (the buyer and the seller) are executing *closing* transactions. Adding this 10 percent figure to our observed statistics of 58 percent gives us the fact that 68 percent of all options have some worth at expiration (and this doesn't even count the ones that are worth more than zero but less than 60 cents). Of course, this doesn't mean that only 30 percent of option buyers lose money—they may have paid more for the option than its worth at the end. Nor does it say anything about what percentage of out-of-the-money options expire worthless, but it *does* prove that the old wives' tale of 80 percent or 90 percent of options expiring worthless is a falsehood. This is important for novices to realize: many are led to naked option selling—sometimes with disastrous results—because they feel that they can sell any option since they are operating under the false assumption that there will be a 90 percent chance of it expiring worthless.

I personally began trading options in 1973 when my broker, Ron Dilks, first pointed out a *Business Week* article to me that talked about listed options on Kresge. Since then, through my various endeavors as individual trader, risk arbitrageur, and money manager, I have had several *hundred thousand* contracts that were held until expiration. I have no exact way of knowing how many were exercised or assigned and how many expired worthless, but my general feeling is that the count is about 50-50. That is, about half were in-the-money at expiration, and half were not. I *do* know, with a certainty born of 20 years of experience, that nowhere near 90 percent expired worthless.

Mechanics of Exercise and Assignment

The control of exercise is at the behest of the owner of the option. He is the one that determines when to exercise. To exercise a stock or index option, he must notify his broker by 4 P.M. Eastern time (or 5 P.M. on expiration Friday) that he wants to exercise his option. His broker then notifies the OCC, which is the central clearing house for all listed stock options. The OCC only deals with member firms (your brokerage firm, for example), so it does not "know" individual customers or individual accounts. The OCC then gathers all exercise notices that it received that night and randomly assigns them to member firms who are short the option series that have been exercised. The next morning, the member firm who was assigned then randomly picks out customer accounts that are short that particular option series and notifies those option writers that they have been assigned. This assignment notice should be received by the option writer well in advance of the opening of trading so he can plan any necessary trading action that the assignment notice might necessitate. The trades are deemed to have taken place on the *day of the exercise*; thus the person who is assigned doesn't find out until a day after the trade has actually taken place.

Futures option exercises work in a similar manner, although times may vary slightly; and the exchange is the clearing center, not the OCC.

Figure 1.1 summarizes what transaction takes place in the underlying security when a put or call option is exercised or assigned. For example, if you exercise a put, you sell the underlying; and the seller of the put, who is then assigned, buys the underlying. This illustration is not correct for cash-based options (see Figure 1.2).

Most novice investors understand that you may first buy a security and then later sell it to take a profit or a loss. There are only two rules you need to know about making money in any market.

1. Buy low and sell high, not necessarily in that order.
2. He who sells what isn't his'n, must buy it back or go to prison.

That is, you may sometimes be better able to profit by selling a security first and buying back later. This is apropos to stocks,

Figure 1.1
EXERCISE AND ASSIGNMENT OF STOCK OR FUTURES OPTIONS

	Call Option	Put Option
Exercise	Buy Underlying	Sell Underlying
Assigned	Sell Underlying	Buy Underlying

options, futures, bonds, or just about anything. The second rule, though, indicates that if this is a physical security—stocks or bonds—then you can't sell it without first borrowing it from an existing holder, or you could have a problem on your hands. However, futures and options may be sold short without any searching for existing physical securities since they are contracts.

This is a good place to define what the term *cover* means. In the context of stock trading, when you first buy stock and then later sell it, you are said to liquidate your position. However, if you had first sold it short, then when you later buy it to close out your position, you are said to cover your position. Thus, it is common nomenclature to describe the closing out of a short position as covering. The term also applies to options. If you initially sell an option as the first transaction, that is called an *opening sell transaction*. This leaves you short the option, and you may someday be assigned on that option, if you do not first buy it back (cover it).

An extremely important point should be noted here: *if you are an option seller, you can't always tell if you're going to be assigned at expiration merely by observing the closing price of the underlying stock; you really need to wait until Monday morning to check your assignment notices.* There are two reasons for this. One is that if a stock holder has a large position that he can't sell in the open market, he might decide to exercise puts (if he owns them) to "blow out" his position. This may be easier than holding onto the stock and trying to rehedge it, or trying to sell it in the open market.

When I managed the arbitrage department for a major brokerage firm, we were long a lot of Dayton Hudson stock on Friday, October 16, 1987, the trading day before the crash. The stock had closed at about 50 on October 15. We also owned the Oct 45 puts as a hedge. Friday, October 16, was expiration day for the October options. As the day progressed, the market dropped over 100 points (the first time in history that that had happened) and Dayton Hudson was being smashed. It closed at 45½, but with very little stock being bid for. It appeared that there was no way we could sell our stock in the open market on Monday since the market was weak and there weren't many bids for the stock (of course, we didn't realize that on Monday there was going to be a crash). In addition, the longer-term options in Dayton Hudson were quite expensive and also rather illiquid. So, we exercised our Oct 45 puts and sold our entire position at 45—below the last sale price. Thus, whoever was short those Dayton Hudson puts was assigned, even though they were out-of-the-money, and he found out on Monday morning that he had bought stock at 45. I believe the stock opened around 42 and traded down from there.

The other reason that an option seller can't be sure about assignments until Monday morning after expiration is that corporate news may be released after the 4 P.M. Friday close. Since options may be exercised up until 5 P.M. on expiration Friday, it is possible for news to come out after the market closes that would make holders of the options want to exercise. This, by the way, is the reason your brokerage firm considers you to have written a naked option if you sell another option on expiration Friday without bothering to cover a deeply out-of-the-money option for a sixteenth.

Major news has come out between 4 P.M. and 5 P.M. on expiration Friday many times. Some of these have involved takeovers and some earnings news, or other corporate news. A rather famous one occurred in 1994. Gerber Products was the subject of takeover rumors for quite a while. On Friday, May 20 (expiration day), the stock closed at 34⅝. After the close, a takeover bid was announced, and the stock opened at 51 on Monday, May 23. Many sellers of the May 35 calls received assignment notices on that Monday morning and were rather upset; some had gone home Friday night assuming that their short May 35 calls were expiring worthless. There were even lawsuits filed, claiming that exercise notices were not delivered to the OCC on time. That is a very difficult allegation to prove, however.

Exercises Prior to Expiration. Futures options are rarely exercised prior to expiration, except when they are deeply in-the-money. In that case, an option holder may exercise in order to reduce his carrying costs for holding an expensive option. Stock options, however, are exercised prior to expiration fairly often. The most common time is on the day before the stock goes ex-dividend. An equity call holder is not entitled to the dividend, so an in-the-money call that has no time value premium will drop in price by the ex-dividend amount.

Example: XYZ is trading at 55 and is going to go ex-dividend by 50 cents tomorrow. The July 50 call, which has only a short time remaining until expiration, is trading at 5. Tomorrow, the stock will open at 54½ (after going ex-dividend the 50 cents). Thus, the call will be trading for 4½ the next morning. The call holder will exercise (or sell his call to a market maker, who will exercise) rather than squander a half point.

Hence, if an in-the-money call has no time value premium on the day before the stock goes ex-dividend, the call holder will generally exercise in order to preserve his value. The call seller, who is assigned, doesn't find out until the next day (the morning that the stock is going ex-dividend). Thus, the seller finds out that he actually sold the stock on the previous day, and thus he does not get the stock dividend. For this reason, it is often the case that when a stock declares a large cash dividend, the terms of the option are adjusted. Such an adjustment protects the call holder.

Cash Option Exercise. We mentioned earlier that index options convert into cash, rather than stock. This is a convenient arrangement that avoids having to deliver hundreds of stocks for one option exercise. For example, there are options on the S&P 500 index. Suppose that the index is trading at a price of 453.47. Then, if an S&P call option is exercised, rather than receive a few shares of each of 500 stocks—which would be a back-office nightmare—the person who exercises receives cash in the amount of $45,347 (100 "shares" at 453.47) less the value of the strike price. If a Dec 400 call was being exercised, the call holder would thus receive a net of $5,347 ($45,347 – $40,000), less commission. The person who is

Figure 1.2
EXERCISE AND ASSIGNMENT OF CASH-BASED INDEX OPTIONS

	Call Option	Put Option
Exercise	Receive Cash	Receive Cash
Assigned	Pay Cash	Pay Cash

assigned is *debited* a like amount of cash, plus commission. Figure 1.2 illustrates the exercise and assignment for cash-based options.

American-style options can be exercised at any time during their life. All stock options, ETF options, and futures options are of this type, as are OEX Index options. *European-style* options can only be exercised at the end of their life. Most index options are European exercise. In Chapter 5, accompanying the discussion of intermarket spread strategies, you will find an in-depth description of how European options behave.

Sellers of American-style options can be "surprised" by an assignment notice, because it can come at any time during the life of the option (there is usually one huge clue as to when such an assignment may happen, and it is that *the option no longer has any time value premium*). Writers of European-style options, however, know that they can only be assigned at expiration, so they can't get called out of their position early. This is an important difference where index options are concerned because all index options are cash-based, and American-style index options can create rather nasty scenarios when assigned.

Example: Suppose that you own a spread in OEX options (which are cash-based and American-style): you are long the December 410 call and short the Dec 420 call, with the index trading at 440. Your spread is probably trading near its maximum value of 10 points (the differences of the strike prices). Then, you come to work one morning and find that

your Dec 420 calls have been assigned. Your account is debited 20 points cash (440 – 420) and you are now left with the Dec 410 calls long, all by themselves. You have gone from a hedged position with very little market exposure to complete market exposure from the long side. If the stock market, as measured by OEX, were to open down substantially on the morning that you receive your assignment notice, you could lose a lot of money very quickly.

For the reason described in the example, most index options were designed to be European-style so that these problems wouldn't occur. However, OEX options remain American-style, a sort of outlaw venue, where macho traders don't fear to tread. Since OEX options are the most heavily traded—and therefore the most liquid—index options, these situations arise quite often, especially shortly before expiration. In fact, it has become rather commonplace for arbitrageurs with large stock and OEX positions to attempt to influence the market so that they can favorably exit their positions via early exercise. These machinations are discussed in Chapter 3.

FUTURES AND FUTURES OPTIONS

Since futures and especially futures options are less well-known to most investors, some time will be taken to describe them. First, let's discuss futures contracts; then we'll get to the options. As noted earlier, futures contracts are standardized, calling for the delivery of a specific amount of a commodity at some set time in the future. That "commodity" may be a physical commodity, such as corn or orange juice, or it may be cash, typically the case for index futures. Notice that there is no mention of anything like a "striking price" such as we have with options. Thus, futures contracts can rise infinitely and fall all the way to zero—owning one does not have limited risk like owning an option does. The margin required for a position in futures is generally much smaller than the actual value of the physical commodity underlying the futures contract—perhaps only 5 percent or 10 percent of the value. This makes the leverage in futures trading quite large, and consequently makes them a rather risky trading vehicle.

One of the things that makes futures so confusing to many is that there is no real standardization between the various commodities. What one might think of as the "expiration date" of a futures contract is typically referred to as the *last trading day*. The last trading day can vary widely within the expiration month, depending on which futures contract you are talking about. For example, March grain futures (corn, wheat, soybean) don't necessarily expire on the same day of the month as March pork belly futures or March S&P 500 futures.

First Notice Day

A more important date for a futures trader is actually the *first notice day*. For futures with a physical delivery, the first notice day is usually several weeks before the last trading day. *After the first notice day, the holder of a futures contract may be called upon to take delivery of the underlying physical commodity.* Thus, if a futures contract on gold calls for delivery of 100 ounces of a certain grade of gold, and you are long gold futures past the first notice day, you may have to accept delivery of 100 ounces of gold at the current market price. If the current price of gold were $400 an ounce, that would require an investment of $40,000. It was mentioned earlier that futures can be traded for only a small amount of margin, thereby creating huge leverage. However, after first notice day, many brokerage firms will require a much larger margin deposit because you are at risk of having to take delivery.

Normally, individual traders in the futures market are speculators who are not interested in taking or making delivery of physical commodities. They close out their positions in advance of first notice day. However, there is always the possibility that you could forget about the date and wind up being called upon to take delivery of some commodity. There are any number of false horror stories about someone having to take delivery of 5,000 bushels of soybeans and having them dumped in their front yard. These are patently false, but they make for good story telling, of course. In reality, your brokerage firm will make arrangements for a physical storage facility to take delivery in your name. You will then be charged fees for use of the storage facility, and any other related charges.

One trader that I knew had a position in gold futures that he rolled from month to month as each contract expired (that is, he sold the near-term month future that he owned and replaced it by buying the gold futures contract that expired in the next month). He figured it was cheaper to own gold in this manner than to actually buy gold and store it in a safe deposit box. He was very careful about rolling the futures out before the first notice day of the contract that he owned, but once he forgot and received a delivery notice.

His brokerage firm told him that they were taking delivery of the requisite amount of gold, in his name, in a depository in Philadelphia. He was assessed a fee of $190 per contract for this service. Of course, since he didn't really want to take delivery of the gold, his broker had to sell out the physical gold and then replace it with futures in his account. This type of transaction is rather common and is called *exchanging physical for futures*. Selling the gold cost another commission, of course, but the net result was rather painless for him. He never actually had to take possession of the gold; he merely had to pay the handling fees for delivery and sale of the physical gold.

"First notice day" does not apply to cash-based futures, such as S&P 500 Index futures. In the case of that type of futures contract, there is no delivery; a cash settlement takes place on the last day of trading of the contract. Therefore, since there is no physical delivery taking place, there is no need for a first notice day.

Single Stock Futures

In 2003, single stock futures were listed. These are futures that have as their underlying 100 shares of listed stock, such as IBM, Microsoft, or Amgen. These futures have all the qualities of a futures contract; that is, they require very low margin (20 percent), they can be sold on downticks, and they don't need to be borrowed in order to sell short. Moreover, the regulatory agencies have worked out the details so that a stock owner/trader/investor does *not* have to have a separate futures accounts in order to trade these (whereas he *would* need a separate futures account if he wanted to trade index futures). That works both ways, too, so a futures trader does not have to have a separate stock account in order to trade these single stock futures.

There are not single stock futures listed for every stock. In fact, in 2004, there were only a hundred or so. But if the product gains popularity in the future, there will be more. The actual stocks can easily be found via an Internet search, most likely on the sites of the two futures exchanges established specifically for the purpose of trading single stock futures: NQLX and OneChicago.

Single stock futures expire in various months: March, June, September, December, and the two other nearest months. They expire on the third Friday of the month, as options and index futures do; and they require physical delivery of the underlying stock if held to maturity. As opposed to most other futures contracts, there are no daily trading limits on single stock futures.

Although there was much fanfare in the introduction of this product, it has not yet proved to be very popular with traders. The extremely low margin—and, thus, high leverage—is apparently not conducive to what most stock traders are looking for. One of the supposed uses of this product was as a hedge. But if a person owns stock and then sells a single stock futures against that stock, he is not only hedged, he has effectively sold his stock position, for he can no longer profit or lose, no matter what the stock does. In reality, a *hedge* is best established with options (Chapter 3 discusses using options as insurance) so that a trader can limit his loss but still have room to make money from his stock holdings. Futures are *not* options; futures are much more like stock.

Perhaps this product will become more popular in the future, but to date it has yet to find an audience.

Volatility Indices and Futures

A new product was listed by the CBOE in March 2004—futures on the volatility indices. These volatility indices are explained in much detail in Chapters 3 and 4; but for definition purposes, one needs to understand that the CBOE, mainly, as well as the AMEX publish indices that attempt to measure the implied volatility of index options. When the volatility index is high, then options are expensive; and when it is low, they are cheap, statistically. The first volatility index, VIX, was created in 1993 (although its price history was backdated to 1986).

For more than 10 years, one could observe VIX but could not trade it directly. It was, and still is, useful as a trading indicator (see Chapter 4), but it could not be bought or sold. Then, in 2004, the CBOE formed a futures exchange as part of its business and began trading futures on VIX.

While, at the time of this writing, it's too early to tell whether this will be a successful product, it certainly seems to have a large number of uses—from speculation to hedging for even the most conservative account—and, thus, this author feels it will be a success.

Futures Options Terms

Expiration Dates. Futures *options* expire in advance of the first notice day, so that all option contracts are out of the way before physical delivery of the underlying commodity begins taking place. This is the reason that some futures options—those on physical commodities, such as soybeans, corn, orange juice, coffee—actually expire the month *before* the expiration month of the futures contract. Thus, March soybean futures options actually expire in February. Ask your broker, check *Futures Magazine* monthly, or check the web site of the appropriate futures exchange for the specific expiration dates of the various futures option contracts. Also, many futures chart books carry the expiration dates of the options. For those who prefer to see the nitty gritty details themselves, Appendix B has a list of when the futures options on most of the major contracts expire. For example, coffee options expire on the first Friday of the month *preceding* the expiration month of the futures contract. Thus, May coffee options would expire on the first Friday of April.

Striking Prices. As mentioned earlier, each different type of futures contract has its own set of striking (or strike) prices for listed options. For example, soybean option strike prices are 25 points (cents) apart, corn options are 10 points apart, pork belly options are 2 points apart, and so on. When first beginning to familiarize yourself with futures options, you are best served by obtaining an inexpensive source, such as *Investors Business Daily* newspaper, that lists all the current options on one page. It is then an easy manner to

observe where the strike prices are located for various futures contracts. For those traders with more sophisticated quote machines, an option "chain" is usually available that will display all currently traded options on a specific type of futures. For example, SIGNAL—a popular quote service that can be run on any computer—is one such source.

Unit of Trading. Every futures option has *one* futures contract underlying it; that is, if you exercise your futures option, it will convert into one futures contract. That is a simple concept; what is more complicated is remembering how many dollars are represented by a one-point movement of either the underlying future or the futures option. With stock and index options, a one-point move is normally worth $100 (except in the case of stock splits, possibly). Futures options are less standardized. For example, a one-point (cent) move in grain options is worth $50, while a one-point move in the S&P 500 Index futures is worth $250. In every case, a one-point move in futures options is worth exactly the same number of dollars as a one-point move in the underlying futures contract.

Appendix B lists these dollar amounts for most of the major futures contracts. However, you can often determine this information from the newspaper listings of futures option prices. The newspaper normally lists the size of the underlying futures contract, in physical terms. The "dollars per point" can normally be determined by dividing the physical contract size by 100. For example, a soybean futures contract is for 5,000 bushels of soybeans, and that information will be listed in the newspaper right along with the prices. Dividing by 100, you arrive at the fact that a one-point (cent) move in soybeans is worth $50.

Price Quotes. Traders of stocks are accustomed to being able to quote a bid-and-asked price for any stock or option they trade. In addition, any broker can obtain that information on his quote machine. Such is not the case with futures contracts nor with most futures option contracts. Rarely are you able to obtain a bid or offer quote for a futures contract on a quote machine. They can be obtained from the trading floor; but unless you are trading directly with the floor, in most cases it is too time-consuming to have your

broker request a quote, for there would be several phone calls involved in getting it.

The trading floors do supply quotes to the major quote vendors. However, they are often "stale" quotes, and one cannot really rely on them much of the time. Where options are concerned, I don't recommend trading with market orders, so you need to know the option's quote. One way to speed up the quote and order-entry process is to place an order at a price you would accept and to ask your broker to relay the *actual* market to you. In this way, your order is effective right away, and you get a quote back, too. If the actual market is far away from your order, then you can adjust the price on your order.

Electronic Trading. Futures can be electronically traded, but only a few markets are actually electronic. The most popular electronic market is that of the S&P e-mini futures on the Chicago Merc. It is a completely electronic market, and anyone with a quote machine can see the actual bids and offer (although not the size of them) at any time. These S&P e-mini contracts are worth $50 per point of movement—one-fifth the size of the "big" S&P futures contract. The big S&P futures continue to trade at auction in the pit during the daytime hours; but at night, they, too, trade electronically on a system called Globex. Some other futures trade completely electronically, and more will surely follow as time goes by.

Be careful when trading with an "electronic futures broker," though. Sometimes your electronic order merely prints out at a human's desk, and then it has to be relayed to the trading floor. Because such a double order-entry process might actually cost you time, be sure to investigate how your electronic broker is actually getting the order to the floor—especially where the actual futures pit is *not* electronically enabled.

Commissions. In the futures market, commissions are generally figured as a constant dollar amount per contract. For futures contracts, commissions are charged only when your position is closed out. Thus, if you buy a futures contract on wheat, for example, you are not charged any commission at that point. Later, when you sell the futures contract, you will then be charged the commission. The

nomenclature to describe this process is *round turn*. If your commission rate is $20 per futures contract, it is usually stated as $20 per round turn.

Futures option commissions are normally a fixed amount as well, but they are charged on both the buy and the sell, just as stock commissions are. In some cases, brokers attempt to charge a percentage of the option's price, but that is not the norm.

The fact that futures and futures option commissions are normally fixed amounts means that they are more or less onerous depending on the contract being traded. For example, if you are paying $20 per round turn and you are trading wheat (which is worth $50 per point), then the commission represents a move of 0.40 point in wheat, which is a rather large commission in terms of the distance wheat must move to make the commission back. However, if you are trading S&P 500 futures, which are worth $250 per point, then the commission only represents 0.08 point, which is less than one tick in the futures and is almost a trivial amount in terms of the future's price movement.

Serial Options. Futures contracts on the same commodity do not normally expire in every month of the year. For example, S&P 500 futures expire only in March, June, September, and December. Others may have five or six futures contract months per year. Experienced option traders know that most option trading takes place in the near-term contracts, especially as the options near their expiration dates.

The futures exchanges realized that activity would be lessened if the nearest term option had as much as two or three months of life remaining. So they decided to introduce options that expire in the months between the actual expiration months of the futures contract itself. These options are called *serial options*. They generally are only listed for the one- or two-month expirations preceding an actual futures expiration month. The futures contract that underlies a serial option is the actual futures contract expiring in the next actual month.

Example: S&P 500 futures expire in March, June, September, and December of each year. There are also futures options expiring in those months. Both the futures and the options are cash-settled and expire on the third Fri-

day of the month. Suppose that the current date is April 1. Then the nearest future expires two and a half months in the future, in the middle of June.

Since the S&P 500 futures contract is a very active one, there is naturally going to be great demand for trading of short-term options. Thus, the Chicago Merc (the exchange where these options are listed) began listing serial options. For example, the April S&P 500 futures options would expire on the third Friday of April; but instead of receiving cash when you exercise these options, you would receive a concomitant position in June S&P 500 futures. Assume you are long an S&P 500 April 460 call. If you exercise it, you would be long one June S&P 500 futures contract at a price of 460 in your account.

Serial options exist on the S&Ps, all the currencies, the grains, all the bond and note contracts, gold, silver, platinum, live cattle, pork bellies, sugar, and orange juice. It should be noted that not every futures contract will have serial options. Some don't need them; for example, crude oil and its related products and natural gas all have futures that expire each month of the calendar year, so serial options are not necessary for those futures. However, many of the others have serial options, although not all.

Remember, the easiest way to tell if serial options exist is to see if there are options with expiration dates that *don't* match the expiration dates of the corresponding futures contracts. If there are, then those options are serial options. This can easily be determined from the newspaper or from your quote machine, if you have access to one.

There are many other nuances of futures options that are different from stock or index options, but they are addressed in the specific chapters on strategy and trading that follow.

INFLUENCES ON AN OPTION'S PRICE

As listed, but *not* in order of importance, there are six factors that influence the price of an option:

1. Price of the underlying instrument.
2. Striking price of the option.
3. Amount of time remaining until expiration.

4. Volatility of the underlying instrument.
5. Short-term interest rates, generally defined as the 90-day T-bill rate.
6. Dividends (if applicable).

Each of these six factors has an influence on the price of an option. In some cases, the factor has a *direct effect.* For example, the more *time remaining* until expiration, the more expensive the options will be—both puts and calls. Conversely, as time decreases, so do option prices. Thus, option prices are directly related to the time remaining. Volatility is also a direct factor—the higher the volatility, the more expensive the options.

However, some of the factors have different effects on calls than they do on puts. Take *interest rates.* When interest rates are high, calls will be more expensive, since arbitrageurs can pay more for the calls that hedge their short stock. However, *puts* will become cheaper when interest rates increase, since arbs will pay less for them. Also having a diverse effect is the *underlying price* itself. For example, as the *underlying's price* increases, calls get more expensive while puts get cheaper. *Dividends*, also, have opposite effects on puts and calls. If a company increases its dividend, calls will be cheaper, and puts will get more expensive. This is because the listed options do not have any right to the dividend. The options' prices merely reflect what the stock price will do; and if the dividend is increased, it will drop farther when it goes ex-dividend. Thus, puts increase in value, to account for the expected ex-dividend drop in stock price, and calls get cheaper.

Volatility

We discuss volatility at length in this book, so we want you to be clear about what it is. *Volatility is a measure of how fast the underlying changes in price.* If the underlying stock or future has the potential to change in price by a great deal in a short amount of time, then we say that the underlying is volatile. For example, over-the-counter biotech stocks are volatile stocks; orange juice futures in winter or soybean futures in summer are volatile as well.

There are two types of volatility that are pertinent to the discussion of option pricing. One is *historical* volatility, which is a statistical measure of how fast the underlying security has been changing in price. Historical volatility is quantifiable; that is, it is calculated by a standard formula, although some mathematicians disagree as to the best exact formula for calculating historical volatility. The other type of volatility is *implied volatility*. This is the volatility that is "implied" for future time periods, and the things that are doing the implying are the *listed options*.

The most startling example of implied volatility that I know of occurred during the crash of 1987. When implied volatility increases, the prices of all options increase as well. Thus, this trader received a pleasant surprise, one of the few pleasant surprise stories that relate to the crash of 1987.

On the Wednesday before the crash (10/14/87), OEX was trading at 295. A customer paid 1⅛ for the Dec 320 calls. These calls were trading with an implied volatility of about 15 percent, which was actually quite low for that era.

On the following Monday (10/19/87), the market crashed, and OEX was trading at 230. The customer figured he had lost his entire investment, and considering the large losses that others had taken, he was actually glad to have only lost a point and an eighth. He didn't even bother getting a quote on these options until Tuesday, the day after the crash, because he figured there wouldn't be any bid for them if he wanted to sell them.

What he didn't realize was that implied volatility had skyrocketed to nearly 50 percent for OEX options in the wake of the crash. The Dec 320 calls—now 90 points out of the money with less than two months until expiration—were trading at 1! Thus he had only lost an eighth. The power of implied volatility is great; it can even bail out losing trades sometimes.

Of course, most stories relating to the crash of 1987 were not so pleasant. In fact, one dogma circulating on the "street" was that "the crash of 1987 was so bad that even the liars lost money."

Another example of the difference between implied and historical volatility occurred in the following litigation situation, where the possible outcome of a lawsuit caused implied volatility to inflate, while the actual volatility of the underlying was quite stable.

An example from early 1994 dramatically shows the difference between historical and implied volatility. Advanced Micro Devices is a maker of semiconductor chips. So is Intel, the leader in the field. Intel had filed a lawsuit against Advanced Micro, claiming patent violations, and the case went to trial. The news caused Advanced Micro stock to drop in price and then stabilize in the low 20s.

The resulting court decision was sure to have a large effect on the price of Advanced Micro. If the courts decided in favor of Intel, Advanced Micro's stock was destined to drop a lot; however, if the decision went against Intel, then Advanced Micro stock was destined to rise back into the 30s, where it had been trading prior to the lawsuit.

As the decision approached, the historical (or actual) volatility of Advanced Micro Devices stock was rather normal: the stock was trading back and forth from about 19 to 22. Thus, the stock was not acting very volatile because no one knew what the odds were of the stock moving up or down when the court handed down its decision; buyers and sellers were about in equilibrium. However, since the option prices were based on where the stock was going to be in the future, they were extremely expensive. For example, with the stock at 20, the calls expiring in one month were selling for over four points! This is extremely expensive for a one-month option on a $20 stock. The puts were similarly expensive. Thus, the options were implying that there was going to be a big change in price by Advanced Micro Devices; or, alternatively stated, the options were trading with a high implied volatility. As it turned out, the court decided in favor of Advanced Micro, and the stock jumped six points higher in one day. After that, the option prices settled back down, and historical volatility and implied volatility were once again in line.

It is often the case that historical and implied volatility on a certain underlying issue are very nearly the same. Even when they differ, the reason is not normally as obvious as in the preceding example. In later chapters, we discuss how to measure these volatilities, how to interpret them, and what strategies to use when they differ.

You might think that it should be a fairly easy matter to determine the "fair" value of an option, given that the price is only dependent on the six factors listed earlier. Five of the six factors are known for certain at any one time. We certainly know the *price of the underlying*, and of course we know what the *strike price* is. We also know how much *time* is left until expiration of the option. Moreover,

it is a simple matter to find out where short-term *interest rates* are. And, if there are any *dividends*, it is an easy task to find the amount and timing of the dividend. The one factor that we can't quantify with any certainty is volatility, especially the volatility in future time periods. This, then, is the "rub" in determining the fair—or theoretical—value of an option. If we don't know how volatile the underlying security is going to be—that is, we don't know how much the underlying is going to change in price and how fast it's going to do it—then how can we possibly decide how much to pay for the option? The answer to this question is not an easy one, and we spend a great deal of time in this book trying to shed light on it.

How the Factors Affect the Option Price

It was shown earlier that each of the six factors has its own effect on option prices. The following table, which shows what happens as each factor *decreases* (if the factor were to *increase*, the result would be the opposite of that shown in the table, in each case):

Factor	Time	Underlying	Interest	Dividends	Volatility
Call price	Decreases	Decreases	Decreases	Increases	Decreases
Put price	Decreases	Increases	Increases	Decreases	Decreases

Moreover, some of these factors are interrelated so that it is not necessarily easy to tell which is exerting more power at any time. For example, if a stock or futures contract rallies, we can't say for certain that a call will necessarily increase in value. If the strike price is too far above the current price of the underlying, even a rather large short-term rally may not help out the call much at all. This would be especially true if there were very little time remaining.

Example: Suppose a stock has been in a long bear market and is trading at 20. Then a rally sets in, and the stock jumps by 5 points to 25 in a day or two. Furthermore, suppose this happens with only a week or so remaining until the nearest expiration. The following data summarize this situation.

	February 7	February 9
Stock price	20	25
Feb 35 call	1/16	1/16
Aug 35 Call	1/2	1 1/4

The Feb 35 call, which is going to expire in a little more than a week, was not helped out by the stock's jump in price; but the longer-term Aug 35 call *was* helped because there is more time remaining for the August option. So stock price, strike price, and time are all related in determining whether the value of an option would increase or not when the stock makes a favorable move.

DELTA

Much more is said about the interdependence of these factors later, but first let's define some terms that are common among option traders. These terms describe just how much of an effect each factor has on the stock price. The best known such term is the *delta* of an option. *The delta of an option measures how much the option changes in price when the underlying moves one point.*

Example: XYZ is trading at 80, and the March 80 call is selling for 4. We observe that when XYZ rises one point to 81, the March 80 call now sells for 4½. Thus, the option increased by a half point when the stock rose by one point. This option is said to have a delta of one-half, or 0.50.

The delta of a call option is a number that ranges between 0.00 and 1.00. To verify this for yourself, note that if a call is way out-of-the-money, it will not move at all, even if the stock rises by one point—the Feb 35 call in the prior example. Thus, the delta of a very deeply out-of-the-money call is 0.00. On the other hand, if the stock is trading far in excess of the striking price—that is, the option is way in-the-money—then the option and the stock move in concert. Thus, if the stock rises by one point, so will the option; hence, the delta of such a deeply in-the-money option is 1.00. The delta of a *put* ranges

between 0.00 and –1.00, reflecting the fact that the put moves in the opposite direction from the underlying security.

In between these two extremes (deeply out-of-the-money and deeply in-the-money), the delta of a call option ranges between zero and one. Call options that are out-of-the-money have small deltas, such as 0.25 or 0.30, meaning that they will increase by only about 1/4 or 3/8 of a point when the underlying stock rises by a point. In a similar manner, call options that are somewhat in-the-money will have higher deltas, such as 0.70 or 0.80, indicating that they will move much more like the common stock, but not *quite* as fast as the stock moves.

Example: The following table is an example of the deltas you might expect to see for various call options on a particular stock XYZ. As you will find out later, there are other factors that affect delta; but for now, we will just observe how delta behaves when we view the relationship of the underlying price and the strike price.

Underlying Price: 80 Date: February 1

Call Option	Call Delta	Put Delta
May 70 call	0.94	–0.06
May 75 call	0.79	–0.21
May 80 call	0.58	–0.42
May 90 call	0.36	–0.64
May 100 call	0.20	–0.80*
May 110 call	0.10	–0.90*

The delta of a put and a call at the same striking price, with the same expiration date, are related by the general formula:

$$\text{Put delta} = \text{Call delta} - 1$$

There is an exception to this formula when the put is deeply in-the-money (the two asterisks in the preceding table). The deltas of stock or index puts, but *not* futures puts, may go to their maximum (–1.00) well in advance of expiration, even when the corresponding

call option still has a positive, nonzero, delta. This has to do with the effects of conversion arbitrage. Thus, in the preceding table, the May 100 put and the May 110 put would probably have deltas of nearly –1.00, rather than –0.80 and –0.90, respectively, as shown.

Did you notice that the delta of the at-the-money option is *not* 0.50? In fact, it is generally higher than that for any type of *call* option—stock, index, or futures (while it is lower for the put option). The reason for this is that stocks or futures can move farther to the upside (they can rise infinitely, in theory) than they can to the downside (they can only fall to zero). This means there is more than a 50-50 chance of prices rising over any extended time period, and thus the delta of the at-the-money call reflects this fact.

Some traders also think of the delta as a simple way of telling whether the option will be in-the-money at expiration. While this is not mathematically correct, it is sometimes useful. Thus, in the table, under this interpretation, we can say that there is a 20 percent chance that the stock will rise and be over 100 at May expiration, because the May call has a delta of 0.20. You may prefer to think of delta in this way, if it makes it clearer to you. There is really nothing wrong with this interpretation.

Understanding the concept of delta is mandatory for option traders, for it helps them to envision just how the option is going to move when the stock price moves. Since most traders have a feeling for what they expect of a stock when they buy it, or even when they buy the options, the understanding of delta can help them decide which option to buy.

What Affects Delta?

Anyone who has traded options, or even thought seriously about them, realizes that an out-of-the-money option does not gain much value when the stock rises slightly; the at- or in-the-money option will rise faster than the out-of-the-money call option. This is true for both puts and calls. Delta gives us a way to measure these relative movements.

For example, suppose a trader were going to buy the stock in the previous example, and he was looking for a quick move of 3 points, from 80 to 83. How much will the May 100 call appreciate? The delta tells us that the May 100 will increase by about 20 cents for

each point that XYZ rises. The increase will then be 3×0.20, or 60 cents. Between commissions and the bid-asked spread in the option, there might not be much profit left if that option were bought; it just won't appreciate enough for a 3-point stock move. However, buying the at-the-money May 80 call should work just fine: it will appreciate by 3×0.58, or 1.74 points (1¾), which is a good move and should leave a good profit even after commissions and the bid-asked spread are taken into consideration.

Of course, if this trader were looking for a move of 20 points by the stock over the next three months, then the purchase of the out-of-the-money calls is more feasible. The trader must therefore adjust his option purchase with respect to his outlook for the underlying security, and the delta helps him do just that.

The previous examples demonstrate the relationship between the delta and the stock's price. However, other factors can influence the delta as well. One important factor is time. The delta of an option is affected by the passage of time. *An out-of-the-money option's delta will trend toward zero as time passes.* This merely means that an out-of-the-money option will respond less and less to short-term price changes in the underlying stock as the amount of life remaining in the option grows shorter and shorter. Sometimes it helps to envision things by looking at the extreme, or "end," points. For example, on the last day of trading, any option that is more than one strike out-of-the-money will probably have no delta at all—it is going to expire worthless and a one-point rise by the underlying stock will not result in *any* price change in the option. On the other hand, if an out-of-the-money option has a *long* time remaining (three years, say), then it *will* be responsive to movements by the underlying stock. *Thus, the more time value that an out-of-the-money option has, the farther its delta will be from zero.*

Just the opposite is true for in-the-money options: *the delta of an in-the-money option will increase to its maximum as time passes.* Again, thinking in the extreme may help. Any option that is more than just slightly in-the-money behaves just like the underlying on its last trading day. Thus, such a call would have a delta of 1.00, and a put would have a delta of –1.00. However, if there is a great deal of time remaining in the option (e.g., three years), even though it is in-the-money, it will have *some* time value premium. Conse-

quently, while its movement may reflect *most* of the price change of the underlying security, it won't reflect all of it, so its delta will be less than the maximum. *Thus, the more time value premium that an in-the-money option has, the smaller its delta will be.*

The delta of an option can change swiftly, sometimes apparently defying the elementary mathematical definition. These concepts are discussed in great detail in Chapter 6, but an example at this time may be sufficient to illustrate the point.

H. J. Heinz stock was the subject of takeover rumors in January 1995. Another food company had recently been acquired, and gossip swirled about the same thing happening to Heinz. As a result, options on Heinz had gained quite a bit of implied volatility. Takeover rumors often "heat up" on Fridays, as traders seemingly feel that there is a greater chance of a deal being announced over a weekend. Thus, it was not unusual that on a Friday, implied volatility reached a peak of about 50 percent. The accompanying table lists some of the option prices on that Friday, and then also shows where the same options were trading on the following Monday, when the stock closed off only 3/8 of a point.

	Closing Price Friday	Closing Price Following Monday	Change
Stock	39¼	38⅞	–⅜
Jan 40 call	15/16	⅜	–9/16
Feb 40 call	1¾	1 5/16	–7/16
March 40 call	2⅜	1¾	–⅝

What was going on here? Each of these slightly out-the-money options was down *more* than the underlying stock. That is, each of these three options had a delta of more than 1.00! Normally, a slightly out-of-the-money option would have a delta of about 0.50 or less.

The actual delta of an option after any stock move can be computed by dividing the option's price change by the stock's price change. This simple calculation yields the following deltas for the preceding options:

Option	*Actual Delta*
Jan 40 call	1.50
Feb 40 call	1.17
March 40 call	1.67

In fact, what had happened was that a negative newspaper article appeared over the weekend. The article basically denigrated the takeover rumors and gave evidence that the company was *not* "in play." Thus, even though the stock itself only traded off three-eighths of a point, the options were crushed as implied volatility fell to about 35 percent from the 50 percent level of Friday. That is a huge change in implied volatility in one day, and it had a very harmful effect on the call prices. This is a vivid example of how a change in implied volatility can affect the price and the delta of an option.

Thus, there is a relationship between price and volatility. It is a well-known fact that a change in one of these factors can affect an option's price. What is sometimes forgotten is that these factors can work together to dramatically affect an option's price, as in the Heinz example. Both volatility and stock price can change dramatically in a short period of time. The other three factors that determine an option's price—short-term interest rates, striking price, and dividend—have little or no effect most of the time, for they don't change much, and certainly not over a short time period.

TECHNICAL ANALYSIS

There are two major approaches to analyzing markets—technical and fundamental. Most investors are familiar with *fundamental analysis*, that is, the process by which analysts attempt to forecast the future profits of a company by analyzing their market penetration, pricing structure, and other things having to do with the actual operation of the company's business. *Technical analysis*, on the other hand, has nothing at all to do with the tangible operations of the company. Rather, it is an analysis of the *price* of the company's stock. Technicians (practitioners of technical analysis) feel that past price patterns leave valuable clues as to the future direction of prices. Technical analysis can be applied to any price pattern—stock, bonds, futures, and so on.

There is merit in both camps, although each camp tends to view the other as being somewhat inferior. This is a classic example of how each camp was "right" and yet each thought the other was wrong.

In 1991, the market was beginning to roll to the upside after the Gulf War was "won." Many brokerage firm analysts were predicting great things for basic U.S. companies, such as Coca-Cola. Earnings were projected to increase for each of the next few years.

Technicians, however, were more interested in what the *market* was saying about Coke. The market's opinion is, of course, registered in the price of stock on a day-to-day basis. In this instance, Coke had traded up to a price of 44 several times but had never been able to go higher. Thus, a technician would have said that while he might believe the fundamental analysts' prediction of good fortune for the future earnings of the company, he would not buy the stock until its price could actually go higher than 44.

That would have been a good strategy, for it wasn't until over two years later that Coke actually traded higher than 44—after repeatedly trying to exceed that level, but failing. A technician would thus have saved his investment capital until the stock price had some momentum.

Technical analysis is more apropos to short-term trading, since it attempts to give some timing on when to buy and when to sell. Fundamental analysis is a good long-range tool, but on the short run it is often woefully late (or way too early) in predicting the actual movement of stock prices; it is therefore a poor technique for timing. Fundamental analysts attempt to predict whether the tangible business operations of a company will make money. However, that information is only vaguely related to the price of a stock in the short term. Most option trading strategies are of a short-term nature, so fundamental analysis is almost useless, and technical analysis is a better approach.

Fundamental reports, however, can and do have an effect on the short-term trading of a stock (in Chapter 4, we examine ways to take advantage of this phenomenon). This usually happens when a company announces quarterly earnings that are significantly different from what the analysts have been expecting. A worse-than-expected earnings report will inevitably cause a stock to drop as soon as the information is made public, while better-than-expected earnings will normally cause the stock to rise in price immediately.

Don't confuse the market's short-term reaction to these fundamental reports with fundamental analysis itself. In fact, had the analysts been able to correctly predict the earnings, there would have

been no "surprise." This is particularly true when the earnings are bad. Usually, by the time that Wall Street analysts change their opinions from positive to negative on a stock, it is too late to benefit stockholders. How many times have you seen a company report surprisingly bad earnings, which causes the stock price to immediately drop, and *then* all the brokerage firms downgrade the stock? Or how about a stock falling from lofty levels—perhaps by as much as 50 percent—and then a brokerage firm downgrades it from "buy" to "hold"? Of what use is that to a short- or intermediate-term trader?

Thus, fundamental analysis may be more appropriate for the long-term picture, but it is not useful for short-term decision making. The following story shows the difference between fundamental and technical analysis quite clearly.

Recently, I read an article that was originally published in 1948, regarding the price of Coca-Cola. The article stated that the price of Coke—which had rallied strongly following the end of World War II—was discounting all of the good fortune in the foreseeable future. Fundamental analysts disagreed, arguing that Coke was on its way to becoming a world leader in soft drinks (at the time, Coke was sold mostly in the United States).

In fact, the inflation-induced recession of 1948 *did* harm the price of Coke and it dropped 30 percent; but today it is many, many times its 1948 price. So, for the long term, fundamental analysts were right; but on the short term, technicians were correct.

Since many of the strategies presented in this book are of a short-to-intermediate-term nature, we favor technical analysis for that purpose. Technical analysis bases its price projections for the future on past prices, moving averages, or volume considerations. These are valuable tools in many cases, and we discuss them in detail as they arise in the context of the option strategies that we are presenting.

This chapter has covered a lot of ground in a short amount of space. Definitions, price behavior, and relationships of the variables affecting option prices have all been described. This has laid the groundwork for most of the later discussions in this book. In the next chapter, we take a look at various option strategies.