Wiley Trading

OPTION STRATEGIES

THIRD EDITION

PROFIT-MAKING TECHNIQUES FOR STOCK, STOCK INDEX, AND COMMODITY OPTIONS

COURTNEY D. SMITH

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To Pam

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Preface

About 20 years ago I approached John Wiley & Sons with the idea to write a guide to option strategies. Several books had been written that gave an overall introduction to options and too many books had been written that purported to show the reader how to make millions while sipping pina coladas on the beach. No book had been written purely on options strategies. Wiley decided to give it a go.

Twenty years and one edition later, the book is still being sold across the country. Few books live that long! I want to thank my readers for their support.

This third edition adds much more information on predicting implied volatility, how to select a strategy, and how to make money trading options. In addition, more material has been added to just about every chapter. And, of course, I've cleaned up even more errors. Thanks to my eagle-eyed readers for spotting them!

One thing I have tried to retain from the first edition is the straightforward approach to options strategies. This book is designed to be used by traders, not read by rocket scientists. I have attempted to keep the math to a bare minimum. There are now plenty of books with plenty of formulas.

The success of this book is gratifying. But the most gratifying success comes from helping you, the reader, make money in the markets. I hope this book helps you to be a trading success.

CHAPTER 1

Introduction

Welcome to the third edition of *Option Strategies*. This book will take you on a guided tour of the world of option strategies.

Options present the investor with a myriad of new strategies. Some are very conservative, such as covered call writing, whereas others are very speculative, such as naked call selling. Options provide more and often better ways to fine-tune your investing strategies to expected market conditions.

This book covers all types of options: stock index, stock, and commodity. Bullish and bearish strategies are covered equally. It will be useful to all options traders and hedgers, from novices to professionals.

DECISION STRUCTURES

A decision structure is an ordered line of inquiry, consisting of a structured series of situations and choices that assist you in analyzing potential trades and in determining your course of action after you have entered a trade. A decision structure is not an exhaustive compilation of all possible strategies but a concise guide to the analysis necessary to deal with the most common possibilities.

In order to achieve your objectives, you must first identify your objectives. This self-evident truth is often forgotten. Two main questions can help you:

1. How much risk are you willing to take? Each person has a subjective criterion of risk. You must have an idea of the level of risk with which you are comfortable so that you can make acceptable investments.
2. What kind of return do you need to take on that level of risk? The greater the risk, the greater should be your prospective reward. Look at competing investments. You might have found a low-risk covered write, but your return might be just above Treasury bills. Why bother with such a trade? Look for those opportunities that have significantly more reward, though they also have more risk.

SIMPLIFICATION OF OPTIONS CALCULATIONS

Most discussions of options calculations are too simple. They highlight the important issues rather than present seemingly irrelevant information. However, in the final analysis, reality is complex.

The major area of simplification has been in the mathematics of options. In general, the calculations given in books and articles have ignored such factors as transaction costs, carrying charges, and taxes. In most cases, this is not critical. However, there is no need to invest in an option trade and lose money because of ignored factors.

The discussions of risk and reward in Chapters 7 to 24 focus on the strategy and usually do not mention carrying charges, unless carrying charges tend to be a major determinant of profitability. For example, carrying charges are rarely going to affect the decision to buy a call, but an arbitrage between an underlying instrument and a reverse conversion is dominated by considerations of carrying charges.

CARRYING CHARGES

Carrying charges, including transaction costs, the bid/ask spread, slippage, and financing costs, must always be considered when deciding on a strategy.

Transaction costs are an ever-present cost of trading. The term *transaction costs* includes commissions, the bid/ask spread, and slippage. Typically, the largest transaction cost is brokerage commissions. Brokerage houses charge commissions on all transactions. Many option strategies involve the use of options in conjunction with other instruments. For example, a covered call write program in stocks involves the sale of a call against the purchase of the underlying stock. The commission on the stock purchase and on the eventual sale should be considered in the investment decision.

Traders of options on the floors of the various exchanges do not need to consider this factor as much. Their transaction costs are pennies per contract.

Another potential transaction cost is the *bid/ask spread* of the investment. (The *bid* is the highest price that someone is willing to pay for the option; the *ask* is the lowest price at which someone is offering to sell the option.) All options and related instruments have a bid/ask spread. For example, an option may have a last price of $4^1/_4$, but the bid may be $4^1/_8$ and the ask may be $4^3/_8$. In general, most investors will have to pay the ask to buy an option, and will sell at the bid price. This has the effect of inducing slippage in calculations of profits, risks, and break-evens. It is usually wise to include at least one minimum tick or price movement into the costs of your option trade. For example, bond futures options trade in units of $^1/_{64}$. It would be a good idea to subtract $^1/_{64}$ from your expected sale price and add $^1/_{64}$ to your expected purchase price.

The bid/ask spread is a major source of profit for floor traders. They typically look to buy at the bid and sell at the ask. This enables them to execute many strategies that cannot be executed by everybody else. Such strategies as conversions, butterflies, and reversals tend to be the exclusive domain of professional floor traders. These strategies tend to be dominated by transaction costs. The ability to buy at the bid and sell at the offer is a powerful advantage in trading these strategies.

Slippage is the final transaction cost and is related to the bid/ask spread. It is the difference between the price that you expect on the fill of an order and the actual cost. For example, you could expect to get a fill at $1^7/_8$ on a purchase of a call, but the market is active and volatile and your order is not filled until the market is up to $2^1/_8$. *Very* conservative investors should include at least another tick on the expected price as slippage for computing expected returns on a trade.

Carrying charges, often overlooked and/or idealized, represent the costs to carry an open position. Traders should at least consider the opportunity cost of initiation and carrying a particular trade. There are an infinite number of investment possibilities. When you decide to do an option trade, you have implicitly rejected all other investment possibilities. You have eliminated the *opportunity* to invest elsewhere. Traditionally, the *opportunity cost* has been quantified as the Treasury-bill rate because it is considered riskless.

Leveraged positions have a finance charge. This finance charge must be considered before initiating a position and while calculating the possible outcomes. For example, a covered write against a stock bought on 50 percent margin will have the profit potential reduced by the financing charges. The term *carrying charges* or *carrying costs* is used throughout this book as a shorthand reference to the various costs associated with carrying a trade or position.

The biggest cost of all is probably *taxes*. This book assumes no taxes on any of the trades when making the various calculations. However, the reader should definitely consider the tax consequences of their trades. This could have a major impact on the long-term efficacy of the trading program.

OVERVIEW OF THE BOOK

The book is divided into two parts. The four chapters of Part One outline the fundamentals of options. This part forms a base for the remainder of the book. Even experienced options traders should scan these chapters to make sure they are using the same terminology as is found in this book.

Part Two contains Chapter 6, which outlines several of the considerations that are important in selecting a strategy. The following chapters discuss each main strategy, the risks and rewards of the strategy, the selection of the various components of the strategy, and the necessary follow-up actions. I have added a new chapter, Chapter 24, which outlines the most critical aspects of trading, psychology, and risk management.

This book is meant to be used every day by the options strategist and trader. Wear it out!

PART ONE

Why and How Option Prices Move

CHAPTER 2

The Fundamentals of Options

This chapter will give you the basics of options. It is necessary to know this information before going on to the other chapters. The concepts presented here will be referred to throughout the book.

WHAT IS AN OPTION?

An option gives a person the right but not the obligation to buy or sell something. A person who buys an option is said to be *long* the option. A person who sells (or *writes* or *grants*) an option is said to be *short* the option.

The buyer of an option pays a premium to the seller. The *premium* is the price negotiated and set when the option is bought or sold. The negotiation is in the form of an auction on the various exchanges. Option buyers pay the premium, while option sellers receive the premium. For example, you could buy an IBM April 140 call for a $5 premium. The buyer of the option pays the premium to the seller. A buyer of an option is said to be *long premium*, while the seller of an option is said to be *short premium.*

The buyer of an option can *exercise* that option by notifying their broker that they wish to exercise the option. Exercising the option means that they actually wish to exercise the terms of the option. For example, say you own one December call on Widget Brothers with a $120 strike price. That gives you the right, but not the obligation, to buy 100 shares of Widget Brothers at $120 per share.

There are two types of option exercise: American and European. We will explain this later in this chapter.

So, to carry on our example. You could exercise that December call anytime before the expiration day in December. Once again, you have no obligation but you do have a right to do it.

The seller of an option has no right to exercise. They must wait to see what the option buyer wants to do. The seller has the obligation to sell 100 shares of Widget Brothers at $120 per share.

In the real world, options are exercised if they are in-the-money at or near expiration only. Prior to expiration, only very deep in-the-money options will possibly be exercised.

There are two types of transactions: opening and closing. An *opening* transaction initiates an options position; a *closing* transaction liquidates the trade. An opening buy is followed by a closing sale, or exercise—a closing exercise following an opening buy means that buyers avail themselves of the right that was bought. An opening sale, or write, is followed by a closing buy, or exercise—a closing exercise following an opening sale, or write, means that sellers must meet their obligation. (This distinction is important for margin purposes, which will be explained later in the chapter.)

Let me give you an example of opening and closing buys and sells.

You want to buy a call. It is called an opening buy because you are initiating the position. It is called a closing buy if you are already short or have written an option first.

Conversely, an opening sell is when you sell short or write an option before you buy it. A closing sell is done after you have bought a call.

Obviously these same considerations apply to puts.

The *open interest* is the total of open options contracts on an exchange and is calculated by the exchange. Every option outstanding is counted. If you open buy an option, the open interest increases by one. Note that you cannot tell the number of buyers or sellers, only the number of contracts existing at the close of trading each day. The open interest is useful in determining the liquidity of an option. *Liquidity* is essentially how easy it is to buy or sell contracts without unduly affecting the price. Liquidity tends to increase as open interest increases. High liquidity is important if you want to place large orders to buy or sell. Open interest is typically reported by the exchanges on the day following the particular trading day.

One of the major considerations in looking at an option is the liquidity. An option with little open interest or volume will be hard to get into and out of. The bid/ask spread will be wider. You will only be able to enter and exit small positions.

An illiquid market is often likened to a Roach Motel©, you can get in but you can't get out! You must expect to hold the position to expiration and not exit earlier.

Why Buy an Option?

It is easy to understand the rationale of buying an option. You get most of the benefits of owning something without most of the risk. In one sense, buying an option can be compared to insurance. For example, insurance lets you have the benefits of owning a car, minus the cost of the insurance premium, without most of the risk of accidents. In options, the call buyer gets most of the price appreciation, if any, without much of the risk of prices moving lower. The put buyer gets most of the price depreciation, if any, without much of the risk of prices moving higher. The seller of the option takes the risk of price appreciation or depreciation in return for the premium, which is similar to the insurance premium.

Why Sell an Option?

Why would anyone want to sell options if they are not in the driver's seat? The answer is money. The price that option buyers must pay is set in an open market. If buyers don't bid high enough prices, sellers won't sell. The net effect is that options prices are bid to a level that option sellers believe compensates them for the risk of selling options. In effect, the buyers and sellers have exchanged an element of risk for a price.

Many people are attracted to options because they have heard the statistics that 70 percent to 80 percent of options expire worthless. Many advisory or educational services use this statistic to suggest that you are way better off selling options rather than buying options. They correctly point out that professional options dealers are net sellers of options and therefore that must be a superior way to make money in the options market.

This is completely false.

The returns of buying or selling options are exactly equal, all other things being equal. Only skill or luck will cause you to outperform or underperform. It is true that most options expire worthless. But if someone were to indiscriminately sell options they would have most of their trades be winners but those winners would be small and their losses would be large. They would net to zero, excluding transaction costs.

An option buyer tends to have a minority of their trades be winners but the winners are a much larger size than their losers. Still, they will also net out to zero.

The options market is too efficient to simply allow someone to make money by selling options.

Dealers are mainly short options simply because their clients tend to want to buy options. They would be buyers of options if their clients were mainly short options. Dealers are simply trying to make the bid/ask out of their trading with clients.

DESCRIBING AN OPTION

It takes four specifications to describe an option:

1. What is the type of option: call or put?
2. What is the name of the underlying instrument?
3. What is the strike price?
4. When is expiration?

The Type

The two types of options are calls and puts. A *call* gives the buyer the right, but not the obligation, to buy the underlying instrument. Call option buyers hope for higher prices, and call option sellers hope for stable or declining prices. A *put* gives the buyer the right, but not the obligation, to sell the underlying instrument. Put option buyers hope for lower prices, and put option sellers hope for increasing or stable prices.

For every buyer there must be a seller. Selling a call means that you have sold the right, but not the obligation, for someone to buy something from you. Selling a put means that you have sold the right, but not the obligation, for someone to sell something to you. Note that the option seller has retained the obligation but no right.

An option described as the *June OEX 600 call at 25* describes a call option on the S&P 100 Index (OEX) with a strike of 600, a premium of 25, and an expiration in June. An option described as the *April Citibank 35 put at* $3^3/_8$ describes a put option on Citibank stock with a strike of 35, a premium of $3^3/_8$, and expiration in April.

The Class or Underlying Instrument

A *class* of options is all the puts and calls on a particular underlying instrument. The something that an option gives a person the right to buy or sell is the *underlying instrument* (UI). Some examples of underlying instruments are:

- IBM
- S&P 100 Index
- Treasury-bond futures

The name of the UI is usually shortened to something manageable; for example, the S&P 100 Index is usually shortened to "S&P 100" or often to its ticker symbol "OEX."

Throughout this book, the UI is referred to as a generic something, which could be:

1. A *stock*, like 100 shares of Citibank stock. (Note that options on stocks are always for 100 shares of the underlying stock. Options on futures are for the same quantity as the underlying futures contract.)
2. Something *tangible*, like 100 ounces of gold.
3. Something *conceptual*, like a stock index. (Conceptual underlying instruments call for the delivery of the cash value of the underlying instrument; for example, the popular S&P 100 option calls for the delivery of the cash value of the index.)

The Strike Price

An option traded on an exchange is standardized in every element except the price, which is negotiated between buyers and sellers. On the other hand, all aspects of over-the-counter (OTC) options are negotiable. (The examples in this book assume exchange-traded options, but the analysis also applies to OTC options.) This standardization increases the liquidity of trading and makes possible the current huge volume in options.

It is easier to buy or sell an option when you only negotiate price rather than every detail in the contract, as in options on real estate—those negotiations can take weeks or months. Exchange-traded option transactions, on the other hand, can be consummated in seconds.

The introduction of FLEX options blurred the line between exchange-traded and OTC options. *FLEX options* are options that are traded on an exchange, but more than the price is negotiable—virtually all of the elements can be negotiated. So far, the popularity of FLEX options has been limited.

The predetermined price upon which the buyer and the seller of an option have agreed is the *strike price*, also called the exercise price or striking price. "OEX 250" means the strike price is $250. If you bought an OEX 250 call, you would have the right to buy the cash equivalent of the OEX index at $250 at any time during the life of the option. If you bought a gold 400 put, you would have the right to sell gold at $400 an ounce at any time during the life of the option.

Each option on a UI will have multiple strike prices. For example, the OEX option might have strike prices for puts and calls of 170, 175, 180, 185, 190, 195, 200, and 205. In general, the current price of the UI will be near the middle of the range of the strike prices.

In general, the higher the UI price, the wider the range of the strike price. For example, a stock selling for less than $25 per share has strike prices 2.50 dollars or points apart, whereas a stock selling for greater than $200 has 10 dollars or points between each strike price.

The exchanges add strike prices as the price of the instrument changes. For example, if March Treasury-bond futures are listed at 80-00, the Chicago Board of Trade (CBOT), the exchange where bond futures options are traded, might begin trading with strike prices ranging from 76-00 to 84-00. If bond futures trade up to 82-00, the exchange might add a 86-00 strike price. The more volatile the UI, the more strike prices there tend to be.

The Expiration Day

Options have finite lives. The *expiration day* of the option is the last day that the option owner can exercise the option.

This distinction is necessary to differentiate between American and European options. *American options* can be exercised any time before the expiration date at the owner's discretion. Thus, the expiration and exercise days can be different. *European options* can only be exercised on the expiration day. If exercised, the exercise and expiration days are the same. Unless otherwise noted, this book will discuss only American options.

Most options traded on American exchanges are American exercise.

Please also note that there are rules on most exchanges where options are automatically exercised if they are in-the-money by a certain amount. (We'll explain *in-the-money* later.)

Expiration dates are in regular cycles and are determined by the exchanges. For example, a common stock expiration cycle is January/April/July/October. This means that options will be traded that expire in those months. Thus, a May XYZ 125 call will expire in May if no previous action is taken by the holder. The exchanges add new options as old ones expire.

The Chicago Board Options Exchange (CBOE) will list a July 2008 series of options when the October 2008 series expires. The exchanges limit the number of expiration dates usually to the nearest three. For example, stock options are only allowed to be issued for a maximum of nine months. Thus, only three expiration series will exist at a single time. Because of this, the option closest to expiration will be called the near-term or short-term option; the second option to expire will be called the medium-term or middle-term option; and the third option will be called the far-term or long-term option.

TABLE 2.1 Expiration Cycles

Option	Cycle
Stock indexes	Monthly, using nearest three to four months
Stocks	January/April/July/October
	February/May/August/November
	March/June/September/December
	Monthly, using nearest three months
Futures options	Corresponding to the delivery cycle of underlying futures contract.
Spot currencies	March/June/September/December, but monthly for nearest three months
Cash bonds	March/June/September/December

Table 2.1 shows the expiration cycles for some of the major types of options. Note that typically only the three nearest options will be trading at any time.

However, there has been a movement toward options on futures that expire every month. These are called *serial options*. They typically exist only for the first several months. They are most common in the currency futures.

The UI of a serial option is the futures contract that expires the same month as the option or the first futures contract that expires subsequent to the option's expiration. For example, the November option in currency futures will be exercised for the December futures contract because that is the next futures contract that exists.

The currencies trade in a March/June/September/December cycle. This means that the September option will be exercised into a September futures contract. The October, November, and December options turn into December futures contracts.

In-the-Money, Out-of-the-Money, and At-the-Money

Other terms to qualify options are *in-the-money*, *out-of-the-money*, and *at-the-money*. They describe the relationship between option prices and the UI price.

1. In-the-money
   - Call option: UI price is higher than the strike price.
   - Put option: UI price is lower than the strike price.

2. Out-of-the-money
   - Call option: UI price is lower than the strike price.
   - Put option: UI price is higher than the strike price.
3. At-the-money: UI price is equivalent to the strike price. (Most people use *at-the-money* to also describe the strike price that is closest to the price of the underlying instrument.)

LIQUIDATING AN OPTION

An option can be liquidated in three ways: a closing buy or sell, abandonment, and exercising. Buying and selling, as discussed earlier, are the most common methods of liquidation. Abandonment and exercise are discussed here.

Exercising Options

An option gives the right to buy or sell a UI at a set price. Call option owners can exercise their right to buy the UI, and put option owners can exercise their right to sell the UI. The call option owner is calling away the UI when exercising the option. For example, owners of October AT&T 50 calls can, at any time, exercise their right to buy 100 shares of AT&T at $50 per share. The seller of the option is assigned an obligation to sell 100 shares of AT&T at $50. After exercising a call, the buyer will own 100 shares of AT&T at $50 each, and the seller will have delivered 100 shares of AT&T and received $50 each for them.

Only holders of options can exercise. They may do so from any time after purchase of the option through to a specified time on the last trading day if it is an American option. For example, stock options can be exercised up until 8:00 P.M. (EST) on the last day of trading. Option owners exercise by notifying the exchange, usually through their broker. The writer of the option is then assigned the obligation to fulfill the obligations of the options.

Option buyers and sellers should constantly check with their broker or with the exchange on the latest rules concerning exercise and assignment if they are going to be holding options until expiration or if they intend to exercise and/or expect to be assigned.

Clearinghouses handle the exercising of options and act as the focal point for the process. If you want to exercise an option, you typically tell your brokerage house, which then notifies the clearinghouse. The clearinghouse assigns the obligation to a brokerage house that has a client that is short that particular option. That brokerage house then assigns the obligation to a client that is short that particular option. If more than one client is short, the obligation is assigned by the method that the brokerage house uses, usually randomly or first-in/first-out. However, another method can be used if it is approved by the relevant exchange. It is, therefore, important for option writers to know their brokerage house rules on option assignment.

Once assigned, call option writers must deliver the UI or the equivalent in cash, if the contract specifications call for cash delivery. They may not buy back the option. They may honor the assignment of a call option by delivering the UI from their portfolio, by buying it in the market and then delivering it, or by going short. The assignment of a put option may be honored by delivering a short instrument from their portfolio, by selling short in the market and then delivering it, or by going long.

If you exercise an option, you will be holding a new position. You will then be liable for the cost and margin rules of the new position. (*Margin*, in this context, is the amount of money you are allowed to borrow using your new position as collateral.) For example, if you exercise a long stock call and want to keep the shares, you will either have to pay the full value of the stock or margin it according to the rules of the Federal Reserve Board. Alternately, you could sell it right away and not post any money if done through a margin account. If you had tried to sell it through a cash account, you would have had to post the full value of the stock before you could sell. In general, exercising an option is considered the equivalent of buying or selling the UI for margin and costing considerations.

When an option is exercised, the brokerage house charges a commission for executing an order on the UI for both the long and the short of the option. For example, if you exercise a call option on American Widget stock, you will have to pay the commission to buy 100 shares of American Widget. This makes sense because, when you exercise an option, you are trading in the UI.

The true cost of exercise includes the transaction costs and the time premium, if any, remaining on the option. (*Time premium* is defined in the next chapter.) The costs make it expensive for most people to exercise options, so it is generally done only by exchange members prior to expiration.

You will not want to exercise an option unless it is bid at less than its intrinsic value. (*Intrinsic value* is discussed in the next chapter.) This will occur only if the option is very deep in-the-money or very near expiration. An option can be abandoned if the premium left is less than the transaction costs of liquidating it.

Options that are in-the-money are almost certain to be exercised at expiration. The only exceptions are those options that are less in-the-money than the transaction costs to exercise them at expiration. For example, a soybean option that is only 0.25 cent in-the-money (worth $12.50) will not be exercised by most investors because the transaction costs will be greater than the $12.50 received by exercising. In all other cases, in-the-money options should be exercised. Otherwise, you will lose the premium and gain nothing. Most option exercises occur within a few days of expiration because the time premium has dropped to a negligible or nonexistent level. Most exchanges have automatic exercise of options that are in-the-money by a specified amount.

Prior to expiration, any option trading for less than the intrinsic value could also be exercised. This premature exercise can also occur if the price is far enough below the carrying costs relative to the UI. This discount is extremely rare because arbitrageurs keep values in line. Even if it occurred, it is likely that only exchange members could capitalize on it because of their lower transaction costs.

A discount might occur when the UI is about to pay a dividend or interest payment. Following the payment, the price of the UI will typically drop the equivalent of the dividend or interest payment. The option might have enough sellers before the dividend or interest payment to create the discount. There are typically a large number of sellers just before a dividend or interest payment because holders of calls do not receive the dividend or interest and, therefore, do not want to hold the option through the period when the payment causes the option price to dip.

In the final analysis, there are few exercises before the final few days of trading because it is not economically rational to exercise if there is any time premium remaining on the option.

CHANGES IN OPTION SPECIFICATIONS

The terms of an option contract can change after being listed and traded. This is very infrequent and happens only in stock options when the stock splits or pays a stock dividend. The result is a change in the strike prices and the number of shares that are deliverable.

A stock split will increase the number of options contracts outstanding and reduce the strike price. For example, suppose that Exxon declares a two-for-one split. You will be credited with having twice as many contracts, but the strike price will be halved. If you owned 20 Exxon 45 calls before the split, you will have 40 Exxon $22\frac{1}{2}$ calls following the split. Note that the new strike prices can be fractional.

A stock dividend has the same effect on the number of options and the strike price. For example, Merrill Lynch declares a 5 percent stock dividend. The exchange will adjust the number of shares in a contract up to 105 from 100 and reduce the strike price by 5 percent. An old call with a strike price of 50 will now be listed as the $47^1/_2$ call.

Exchanges will list new strikes at round numbers following the split or stock dividend. The fractional strikes disappear as time passes.

THE OPTION CHART

The option chart is a key diagram that will show up throughout the book. It shows the profit or loss of an option strategy at various prices of the UI at expiration. Figure 2.1 shows an option chart of a long call option. The scale on the left shows the profit or loss of the option. The bottom scale shows the price of the underlying instrument at expiration.

The chart illustrates the key fact that the price of an option generally rises and falls when the price of the UI rises and falls. Thus, a call option buyer is bullish (expecting prices to rise), and the seller is bearish (expecting prices to fall or stay stable). A put option buyer is bearish, and the seller is bullish. For example, if the price of Widget International was $30 and you were holding a July Widget 40 put, you could exercise the option and make $10 per share. If the stock dropped to $25, you would make $15 by exercising. By exercising the put, you have taken stock you can buy for $25 in the open market and *put* it to someone else for the strike price of $40. Your purchase price is $25, your sale price is $40, and your profit is therefore $15.

Option charts usually do not consider the effects of carrying charges. They exist to give a quick overview of the effect of changes in price, time, and volatility on the price of an option. The most common charts show the

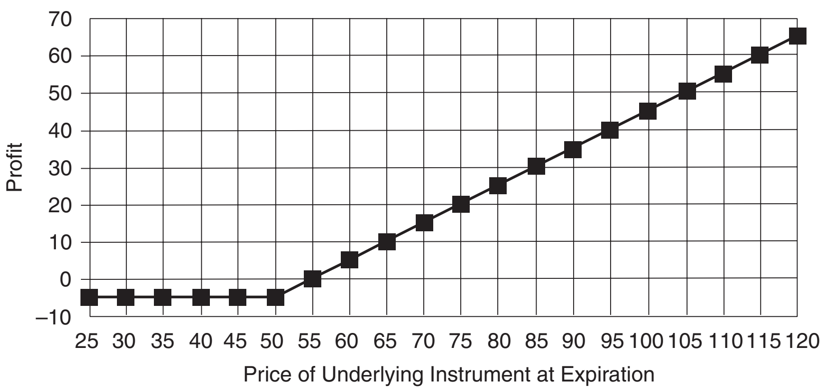


FIGURE 2.1 Option Chart

profit or loss of the strategy at expiration only. However, some charts will show the profit or loss characteristics of a strategy before expiration.

At expiration, the profit-and-loss line of an option will bend at the exercise price and cross the zero-profit line at the point that equals the exercise price plus the premium, for a call, or that equals the exercise price minus the premium, for a put.

PRICE QUOTES

Price quotes are essentially like the quotes of the UI. The following shows typical option price quotes found in a newspaper:

Chicago Board—Index Options

Expire date Strike price	Sales	Open Int.	Week's High	Week's Low	Price	Net Chg.	N.Y. Close
SP100 Apr 530 p	2434	7721	.25	.125	.125	−.0625	633.55
SP100 Apr 565 p	1724	5449	.875	.25	.3125	−.8125	633.55
SP100 Apr 570 p	2232	10406	1.0625	.375	.4375	−.8125	633.55

The rows are for the prices of the various strike prices; the columns are for calls and puts and the various expirations. With few exceptions, the units of price are the same as the UI. For example, because each option is for 100 shares, a price of 4.375 for an option on a stock means the total price for the option is 100 times the cost-per-share of the option, or $437.50.

Quotations for options on Treasury-bond and Treasury-note futures are quoted in 64ths, whereas the underlying futures are quoted in 32nds. Many people make trading mistakes when trading these options due to this difference.

Price quotes on quotation services will be priced the same, but each quotation service has a different code for each option. Consult with your quotation service for the quote symbol of the option in which you are interested.

Options quotes are available on the previous day's close in the *Wall Street Journal*, *Investor's Business Daily*, and almost all big-city dailies. Quotes are available on all the major quotations services. They are also available on the Internet or you can call your broker for quotes.

COMMISSIONS

Options commissions are calculated differently at each brokerage house. There are, however, two main styles of calculation.

The first and simplest method is the flat rate in which the broker makes a single charge for each option. For example, a broker could charge $100 for executing a gold option trade.

The other common method is to charge a percentage of the value of the premium. For example, the broker could charge 5 percent of the premium. If you bought a stock option for $20, the premium would be $20 times 100 shares, or $2,000, and the broker's commission would be 5 percent of $2,000, or $100.

Some brokers will combine the two styles. For example, the commission could be 5 percent of the premium, with a minimum of $30 and a maximum of $100.

The advent of online brokers has reduced commissions to dimes per options on most instruments. It is important to keep commission costs to a minimum no matter what strategy your broker uses. A reduction in trading costs can have a big impact on your bottom line at the end of the year. The increase in return in percentage terms is particularly important for hedged options strategies, like covered writes, because they have two or more commissions for each trade.

I use a strategy that theoretically should consistently make me 65 percent per year but transaction costs reduce that to about 45 percent per year.

However, the cheapest commissions might be a false economy. Be sure to look at the total package from the brokerage house. You might pay fewer commissions but receive no support or perhaps poor order execution. The cheapest brokerage house could turn out to be the most expensive!

ORDERS

Option orders are the same as orders for stock indexes, stocks, or futures. In general, the accepted orders for options are the same as those accepted for the UI. Special considerations about orders will be mentioned when necessary in the rest of the book.

CHAPTER 3

The Basics of Option Price Movements

In the final analysis, options prices are set by the negotiations between buyers and sellers. Prices of options are influenced mainly by the expectations of future prices of the buyers and sellers and the relationship of the option's price with the price of the instrument. It is important to note that options prices are nonlinear: They do not change (go up and down) in exact correlation with the price of the underlying instrument (UI). This chapter and the two chapters following will explain the complexities of what moves options prices.

This chapter outlines, from a nontechnical and intuitive basis, the main factors that move options prices. The terms that option strategists use to describe some of these main determinants are often called the "greeks" because some of them are the names for Greek letters. The more advanced concepts will be left to Chapters 4 and 5, which introduce some math and the more technical aspects of the greeks, as well as showing how to use the greeks to identify the characteristics of an option strategy.

This may get a little dense but it is worth it for your bottom line.

THE COMPONENTS OF THE PRICE

An option's price, or premium, has two components: intrinsic value and time, or extrinsic value.

1. The intrinsic value of an option is a function of its price and the strike price. The *intrinsic value* equals the in-the-money amount of the options. For example, a United Widget 160 call will have an

intrinsic value of 15 if the price of the UI is 175. This is simply the difference between the strike price and the current price of the stock. The intrinsic value of an at- or out-of-the-money option is zero. Thus, an out-of-the-money option is an option with only time value.

2. The *time value* of an option is the amount that the premium exceeds the intrinsic value.

$$\text{Time value} = \text{Option premium} - \text{intrinsic value}$$

Time value effectively reflects the amount of risk of the option attaining in-the-money status.

Alternately, the time value for in-the-money calls and puts is:

$$\text{Call time value} = \text{Option premium} + \text{strike price} - \text{price of UI}$$
$$\text{Put time value} = \text{Option premium} - \text{strike price} + \text{price of UI}$$

Parity

An option trading for its intrinsic value is trading at *parity*. Only in-the-money options can trade at parity. This usually occurs very close to expiration when the time value can easily be zero. It also typically occurs when the option is very deep in-the-money. For example, an option with a strike price of 50 will be considered very deep in-the-money if the UI is trading at 70 and there is only one day left until expiration.

Time Value

There are two ways to look at time value: (1) time value is greatest on options with the greatest time until expiration; (2) time value tends to be at its greatest when the UI is near the strike price for all those options that expire at the same time (this phenomenon is explored later in this chapter and in detail in Chapter 5). Table 3.1 shows an example of how time value

TABLE 3.1 Relationship of Time Value to Strike Price

Strike price	May call price	Intrinsic value	Time value
165	19	$17^3/_4$	$1^1/_4$
170	15	$12^3/_4$	$2^1/_4$
175	11	$7^3/_4$	$3^1/_4$
180	$7^7/_8$	$2^3/_4$	$5^5/_8$
185	$4^7/_8$	0	$4^7/_8$
190	$3^1/_8$	0	$3^1/_8$
195	2	0	2

is higher the closer its strike price is to the current market price of the UI: *Widget Equipment is priced at 182$^{3}/_{4}$.*

THE FACTORS THAT INFLUENCE OPTIONS PRICES

Six key factors influence options prices. They are:

1. Price of the underlying instrument
2. Strike price
3. Time remaining until expiration
4. The risk-free rate
5. Expected volatility
6. Dividend or interest payments, if any

Fair Value

An option has a fair value. The *fair value* is the price at which the option should trade, given the six listed factors. The concept of fair value has far-reaching implications. A common use of fair value is to calculate the expected price of an option when given various combinations of these six factors. For example, you might be considering buying an option, and you calculate its fair value from these factors: (1) UI climbs $5, (2) there are 10 days left to expiration, (3) the expected volatility declines from 15 percent to 10 percent, and (4) there is a dividend payment.

Another person might use different assumptions and have a different fair value. Calculations of this type are important for deciding if the price of the option is a good deal. You can compare your assumptions with those of the market to determine strategies.

The difference between your estimate of the fair value of an option and its current market price is sometimes called the *theoretical edge* (this concept is discussed in detail in Chapter 4 and is used extensively in describing option strategies).

Price of the Underlying Instrument

The price of the UI is the most important influence on an option price. In combination with the strike price, it determines if the option is in-the-money or out-of-the-money.

The *delta* (Δ), or *hedge ratio*, measures the relationship of changes in the prices of the option and the UI. The relationship between the option and the UI changes as the factors outlined here change, but the delta measures only the sensitivity of the option price to changes in the price of the UI. The delta is calculated using option evaluation formulas.

A delta of 0.50 means that the price of the option will move half as much as the price of the UI. For example, if the price of the UI moves $5.00, the option price will move $2.50. The delta can range between 0.00 and 1.00. The delta is the percent change of a single point move in the option when the UI moves one point.

The delta changes as the price of the UI changes. A deep in-the-money option will have a delta approaching 1.00, while a deep out-of-the-money will have a delta approaching 0.00. Figure 3.1 shows an option value chart. It shows the price of the option at various prices of the UI and breaks the option price into intrinsic value (the shaded area) and time value. The delta is the slope of a line tangent to the price curve. As the price moves up the curve, the slope increases, hence the delta increases. This also means that the delta changes with every change in price of the UI.

However, the delta represents the relationship of the option price and the UI price for only an instant. It is only a snapshot Everything is dynamic. As soon as the price of the UI *or* the option moves, the delta changes.

A delta of 0.50 suggests that the price of the option will move half as much as the price of the UI. However, if the price of the UI moves higher, the delta of a call option will increase and the price of the option will move more than half as much. For example, presume a delta of 0.50. If the price of the UI increases $10, the option might actually increase by $6; the option might decrease by only $4 if the UI drops $10.

The *gamma* (γ) is the amount that the delta moves with changes in the price of the UI. Put another way, it is the rate of change of the delta for each one-point move in the UI. It is expressed as points of delta for every point change in the UI.

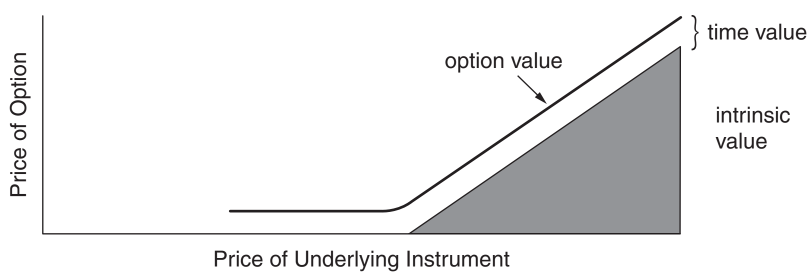


FIGURE 3.1 Option Value Chart

For example, if an option has a delta of 0.50 and a gamma of 0.05, then the delta will be 0.55 if the price of the UI rises one point, and 0.45 if the price falls one point.

The delta is important for both traders and hedgers. Traders can use the delta to help identify the options with the most responsiveness to the UI. Hedgers need to know the delta to have the proper number of contracts to hedge their particular instrument.

Strike Price

The strike price has a major impact on the option price because it determines whether the option is in-the-money or out-of-the-money. Figure 3.2 is a call option value chart showing only the intrinsic value of an option. Note that there is no intrinsic value until the UI's price is above the strike price (50).

Figure 3.3 is an option value chart that shows the price of the option, including the intrinsic value (the shaded area) and the time value. It shows that the time value is greatest when the UI's price is at the strike price. This illustrates the same principle as Table 3.1. In addition, Figure 3.3 and Table 3.1 illustrate that the time value is lower as the price of the UI moves away from the strike price.

This is important because it illustrates what happens to the option's price as the UI's price changes. For example, say you bought a 65 call when the price was 50. As the price of the UI climbs, the option price climbs; but the components of the price change when the UI's price surmounts the strike price. The components of the option price change from all time value to increasing intrinsic value. Notice also how the profits accelerate as prices approach and pass the strike price.

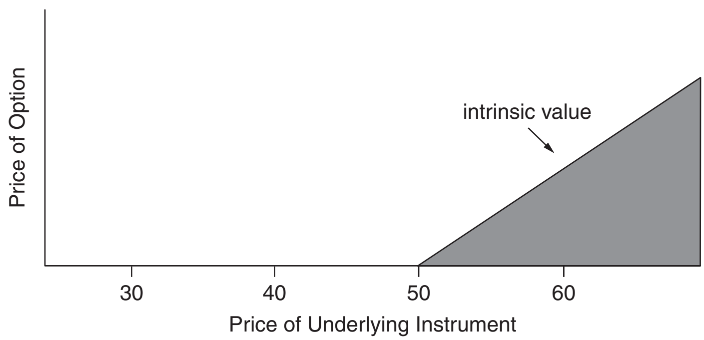


FIGURE 3.2 Call Option Value Chart

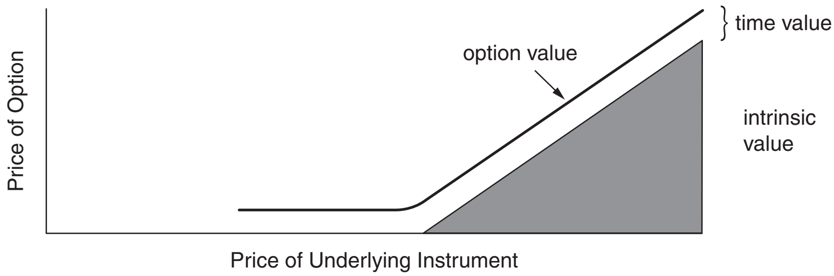


FIGURE 3.3 Option Value Chart

Time Remaining until Expiration

Options are called a *wasting asset* because their value declines over time. The time remaining until the exercise date increases in importance as the exercise date nears. When you buy an option, you are paying for the right to buy or sell something. The option has a time limit. The value will naturally decline as time progresses, all other things being equal.

Figure 3.4 shows the option value curve at different times in the life of the option, that is, with different numbers of days left to expiration. This illustrates that the time value of the option declines as the expiration day approaches. In addition, it demonstrates that far options will always be priced higher than near options. The difference is greatest when the UI price is at the strike price, but it declines as the UI price moves more in-the-money or out-of-the-money.

Time value does not decline in a straight line. Instead, it declines very little in the early days of its life and declines more sharply the closer it is to expiration. Figure 3.5 shows the typical decline in value if everything else stays the same.

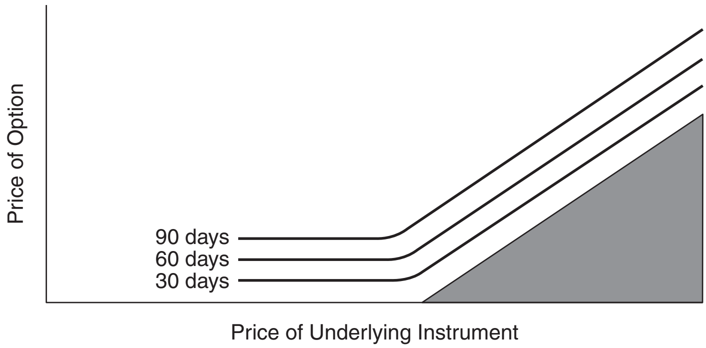


FIGURE 3.4 Option Value Chart

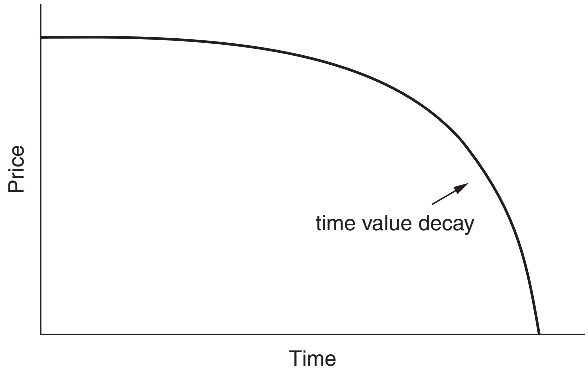


FIGURE 3.5 Time Decay

The time value decay accelerates as expiration nears. The rate of decay is roughly a function of the square root of the time remaining. You can estimate the relationship of the rate of decay of two different options by taking the square root of the months remaining on the longest option. For example, the rate of decay of a two-month option is twice that of a four-month option because the square root of four is two.

The rate of decay is called *theta* (θ). This is the loss in theoretical value that will occur if another day passes, all other things being equal. Theta measures the time decay of an option, usually in points per day. A theta of 0.005 means that the option will lose 0.5 of a price unit each day. For example, an option with a theta of 0.10 and worth 6.95 today will be worth 6.85 one day later, all other things being equal.

Sometimes the theta of a complex position is given in dollars per day for the portfolio as a whole. This is particularly true if the portfolio contains different instruments. It would not make sense to mix the thetas of two different instruments, particularly if they are different commodities. For example, mixing the thetas of IBM and AT&T options *might* make sense, but it definitely does not make sense to mix the thetas of gold and silver in the same portfolio. As a result, most options traders use the dollar value of the various thetas in their portfolios when they have mixed UIs.

Interest Rates

The level of interest rates also affects the price of options. The higher interest rates are, the higher the premium will be for options. The reason is that options premiums are competing investments with debt instruments. Part of the pricing of an option premium is the so-called risk-free rate, which is usually considered to be the short-term Treasury-bill rate. Option pricing theory says that the return to an investor cannot be less than the risk-free rate for the same time period because the option is a much riskier investment and the returns must be higher. This will be discussed in more detail in the next chapter and in the sections of the book dealing with option pricing models.

Rho (ρ) is the sensitivity of an option's price to changes in the level of interest rates. Few traders take rho into account when trading options because the changes in interest rates have little effect on option prices. Typically, option strategists just plug in the current interest rate and forget it.

Here's an example of the change in value of an option when the level of interest rates changes from 6 percent to 7 percent, all other things being equal. Assume a strike price of 50 with the UI trading at 50 with 90 days to expiration and an implied volatility (see next section) of 20 percent. This option will have a value of 1.95 with interest rates at 6 percent. The value of the option is still worth 1.95 if interest rates move to 7 percent. Interest rates would have to move all the way up to 8 percent before the value of the option moves down to 1.94.

As you can see, interest rates have little effect on option prices unless you live in a country with hyperinflation or where interest rates are moving rapidly and sharply.

Foreign exchange options actually have to take into account two interest rates because there are two country's currencies involved. As a result, option theorists have come up with *Phi* (ϕ), which is the *difference* between the two countries' interest rates. Phi has even less of an effect on option prices than rho does. Typically, the only traders who pay attention to rho and phi are arbitrageurs who are looking to make microscopic profits on their positions. Interest rates are typically looked at for such strategies as:

- Butterflies
- Conversions
- Reverse conversions or reversals
- Boxes

This book will, therefore, generally ignore the effect of rho and phi in discussions of most strategies. Their effect will be mentioned in those strategies where they will have an impact.

Expected Volatility

The price of the option will be influenced by the expected and recent volatility of the UI. (*Volatility* is the limit of how far up and how far down prices go—see Chapter 5.) The more volatile an instrument is, the more valuable the option usually considered will be because increased volatility means there is a greater chance for the option to make money. Suppose you buy an out-of-the-money option with a strike of 60 and a price of 2 when the UI is 50. The price range of the UI for the past year has been 48 to 52. Unless something dramatic occurs, it will be unlikely that the call will expire with any intrinsic value. On the other hand, a recent range of 25 to 75 suggests a much greater chance that the option will expire in-the-money.

Investor's perceptions of future volatility are largely influenced by recent volatility. The option price is based on the expected volatility from the time of purchase to the time of expiration. Volatility might have been very low prior to initiating the position, but the market might expect the volatility to increase because, for example, earnings estimates are due to be issued or there is a series of economic reports about to be released.

Volatility can play a large role in selecting option strategies because of its powerful effect. The following chart shows the price of an at-the-money call with the price of the UI at 65 with 23 days remaining until expiration.

Volatility	Option Price
10	0.61
11	0.67
12	0.73
13	0.79
14	0.85
15	0.91

The price of an option can be broken into various components. Models for determining the fair value of options can be turned on their heads and used to compute the components of the current price. *Implied volatility* is often calculated because of its importance. The implied volatility of an option price is the expected volatility that is implied in the current option price.

The responsiveness of the option price to changes in the volatility is called *vega*. Vega measures how much the price of the option will change, given a 1 percent change in implied volatility. A vega of 0.20 means that the price of the option will move 0.20 of a price unit for every percentage-point change in implied volatility. For example, an option worth 3.00 with a vega of 0.30 and an implied volatility of 20 percent will be worth 3.30 if implied volatility rises to 21 percent.

(Please note that vega is not a Greek letter. This is why these various measures of option sensitivity are called *greeks*, with a lower-case “g” and the term often in quotes. Some academics prefer to use Greek letters for all measures, so *kappa* (κ) and even *zeta* (ζ) are occasionally used. Vega is used in the remainder of the book because it is the most common term used by traders and strategists.)

The concepts surrounding volatility are so important to option strategists that an entire chapter, Chapter 5, is devoted to volatility.

Dividend or Interest Payments

If a stock pays dividends (and many do), the dividends affect the price of an option on that stock particularly at the time that the payment is made. The value of the underlying stock will rise each day, all other things being equal, until the day the dividend or interest is paid. This is because the value of the stock is increased by the impending payment. For example, a stock with a $1 dividend payment is worth more one day before the ex-dividend day than 30 days before. (The *ex-dividend day* is the last day that you can own a stock *and* receive the dividend.) The reason is that the total return of buying the stock is greater one day before ex-dividend day because you will have that $1 dividend.

The day after the dividend payment is made, the price of the stock will drop approximately the same as the value of the payment. This affects the option as well. The option price will drop following the payment, even though the option owner does not receive the payment. This also has the effect of reducing the value of options that pay high dividends relative to those that pay low or no dividends. The dividend also has the microscopic effect on options of having the dividend receiver earn interest on the dividend.

The same sort of situation exists for options on interest-bearing instruments, such as bonds. The price of the option rises slightly each day until the interest payment is made. The price of the option then declines. The daily rise in value is essentially imperceptible though the decline related to the payment is often easy to note.

Once again, there is the additional microscopic effect on the value of the option of being able to earn interest on the interest. This compounding effect is virtually unnoticed unless you are holding multiyear options or the total value of your portfolio is huge enough to see the effect.

The main option traders who pay attention to the compounding of dividend or interest payments are the professional market makers in such instruments as interest rate caps and long-term over-the-counter equity options. Just about everybody else ignores the effect of compounding.

KEY OPTIONS CALCULATIONS

There are several key calculations necessary when trading options. What is the most amount of money I can make? What is the worst that could happen to me?

Size of Position

The size of the position can make a significant difference in your return. Commission costs and, to a lesser extent, financing costs are reduced per unit the more shares, stock index contracts, or futures contracts are written against. For example, a covered write program using GM stock will cost less per trade in commissions using 100,000 shares than using 100 shares. The net effect is that, the greater the position, the higher the investor's returns will be and the better the break-even point will be.

Offsetting this may be an increased amount of slippage due to a lack of liquidity because of the size of position being initiated. Trying to buy 100,000 options contracts at the market will move the market significantly. You might start buying the options when they are trading at 2.00, but your buying pressure alone might overwhelm any sell orders in the market, and the price might blast up to 2.50. Your slippage will be about 0.50 per option contract. Your commission bill will be small because you will have negotiated a good rate because of your size, but the slippage will be much greater than the commission savings.

Importance of Price

The returns of any option strategy are affected by the price paid or received. This is particularly true with hedged strategies, such as covered writes, spreads, combos, and straddles. The gain or loss of a tick can have a profound impact on the return of the investment. This means that you should be alert to not giving up that last dime when entering a stock order.

On the other hand, it is also important to be alert to false economies. You might be trading an option and looking for a huge move in the UI to drive the value of the option to atmospheric heights. Then it would be smart to give up ten cents to the market or specialist to get the order filled and capitalize on the whole move.

You, therefore, need to be looking at the kind of strategy you are using to determine the importance of price to that strategy. (The discussion about liquidity in Chapter 2 is relevant in this context as well.) In general it is best to enter orders at a limit price. Thus, you would buy an option by placing a specific buy price in the order ("Buy 10 July 50 American Widget options at 1.10") rather than at the market.

Break-Even Point

The break-even point is the price point where you neither make nor lose money on your investment. Each option strategy has a different break-even point. Figure 3.6 shows the break-even point for a purchase of a call: At 55, the gain in the price of the widget is equal to the cost of the call.

The break-even described here refers *only* to the break-even at the expiration of the option. You can lose money before the expiration of the contract if the price of the instrument declines. For example, suppose the instrument went to $45 on the first day after buying a call. The value of the call will have dropped below its $4.00 initial price, but not enough to offset the decline in value of the instrument. This is because the value of the call is composed mainly of time value rather than intrinsic value. The decline in the UI price causes a decline in the option price but not to the same extent as if the option were in-the-money and had more intrinsic value. Don't forget: The simple break-even point describes the situation only at the expiration of the option.

Figure 3.6 shows the change in the break-even over time. Eventually, the position loses all its time value. The valuation curve illustrates the classic options curve.

The actual break-even point at expiration is the same as the simple break-even point, but you must take into account transaction costs and

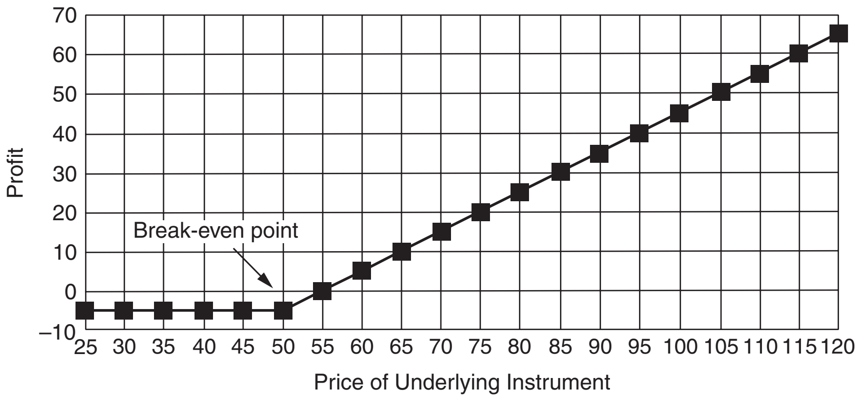


FIGURE 3.6 Break-Even Point

carrying charges. Thus, the formula is:

$$\text{Actual break-even point} = \text{Simple break-even point} \\ - \text{transaction costs} + \text{carrying charges}$$

The break-even point is affected by many factors, primarily the type of account and transaction. For example, a trade using stocks can take place using cash or margin. The carrying charge for a cash transaction will only be the opportunity cost. The carrying charge for stock bought on margin includes the cost of financing for the additional stock.

Also note that carrying charges can be positive or negative. Some strategies, particularly those with lots of options that are sold, create positive carrying costs. This means that you will earn money each day on the carrying charges. Other strategies will cost you money to hold every day.

The formula for the actual break-even point shows that you will add the carrying charges to the rest of the equation. Of course, if the carrying charges are negative, then you will be adding a negative number, which is the same as subtracting. For example, suppose it costs you $1.00 per day to carry your position. You would then *subtract* $1.00 from the equation to find the break-even point.

Net Investment Required

The net investment required is the dollar amount necessary to initiate the trade. Each option strategy requires a different investment. A major determinant of the amount is the type of trade. Are you buying or writing the option? Is it a mixed transaction that involves options and other instruments? Is the trade going to use cash, or will margin be used? The net investment required is detailed later in the discussion of each specific strategy.

The Investment Return

It is just as important to know the return on your investment as it is to know the break-even point. There are several major ways to calculate the return on your investment. Each way presents a different perspective on the proposed trade.

A key way to make comparisons between various strategies is to annualize the return. For example, you might expect to make 13 percent on one option strategy for two months but 9 percent on another strategy that you will hold for one month. You will likely prefer the one-month investment because the annualized return of 108 percent (9 percent $\times$ 12 months $=$ 108 percent) is greater than the annualized yield of 78 percent (13 percent $\times$ $^{12}/_{2}$ months $=$ 78 percent) of the other investment.

However, you should use the annualized yields to compare two similar strategies, not to compare one strategy with other types of investments. For example, you make 9 percent for a one-month investment, but you do not know what your return will be for the remaining 11 months of the year. You might be able to reinvest at only 5 percent and would have been better off investing in a certificate of deposit at 8 percent for a year.

All discussions of return should also be tempered with the risk. One strategy might make 10 percent while another strategy makes 9 percent. It might be that the second strategy is still the best strategy because the risk is significantly lower. Think in terms of the amount of risk you are taking for each unit of profit.

Return-if-Exercised

The *return-if-exercised* is the return that the strategy will earn if one or all of the short or written options are exercised. The return-if-exercised is not used if you have not sold short or written any options. The return is calculated by making the assumptions that the option is exercised and no other factor changes.

The return is also affected by the type of transaction and account, which affect the carrying costs and the final position that the investor owns after the option is exercised.

For example, in a covered call position, the return-if-exercised is the return on the investment if the underlying stock was called away. Suppose you are long 100 General Widget stock at \$50 and short one General Widget \$45 call options at \$7. The option expires in three months. The return if exercised would be the \$2 profit on the option divided by the \$50 price of the stock. The annualized return would be (\$2 ÷ \$50) × (12 ÷ 3), or $^{1}/_{25}$ × 4, or 16 percent.

Note that the initial investment was assumed to be \$50 for the stock. The return-if-exercised would be significantly different if the stock had been bought on margin. The cost of borrowing the money would then have to be taken into account. Also note that dividends or interest payments, if any, should be taken into account, as well as the interest earned, if any, on the proceeds of the short option. All of these carrying-charge-type factors will affect the return-if-exercised.

Look at the same General Widget example but with these changes: the transaction is on margin, the broker loan is 12 percent, the holding period is three months, the return on the short option premium is 10 percent, and there is a dividend of 4 percent. Now, you would receive the \$2 profit plus an assumed \$0.50 dividend (you must look closely at the chances that you will hold the position through the next dividend before making this assumption) plus an interest premium on the short option premium of \$0.175 (\$7 option premium times 10 percent divided by 4), for a total income of $2.675. Expenses will be the cost of carrying the margin position of $0.75 ($25 borrowed times 12 percent broker loan rate divided by 4). Thus, the net income will be $2.675 – $0.75, or $1.925, on an investment of $25, for an annualized return of 30.8 percent.

The second General Widget example given assumed that you sold short an in-the-money option and that the price of the UI did not decline to below the strike price—in other words, the price of the option did not change and the stock was called away by the exercise. But what if the price dropped below the strike price? The option would not have been exercised, and the preceding calculation would not occur.

This shows the main problem with calculating the return-if-exercised. It assumes that the option is exercised, which requires that you make an assumption on the price of the UI.

Also note that there is a greater chance that the return-if-exercised will be an accurate description of the eventual return to you the deeper in-the-money the option is. For example, writing a $40 call against an instrument trading at $50 will give you a much greater reliability for expecting the return-if-exercised to be accurate than if you write a $60 call that is out-of-the-money.

Return-if-Unchanged

The *return-if-unchanged* is the return on your investment if there is no change in the price of the UI. This calculation can be done on any option strategy. It also assumes that the option price does not change and so describes the most neutral future event. For this reason, it is a popular return to calculate. It is often the starting point for the option strategist for identifying a possible investment. Of course, the chances of the UI price being *exactly* unchanged are very low. As a result, this is just the starting point for analysis of the strategy, not the final analysis.

The calculation is done in much the same manner as the return-if-exercised, except that the strategy can include multiple legs, or options. There can be different strikes and types in the calculation.

However, the return-if-unchanged does not usually use different maturities. Further, it is not used in complex options strategies that use different UIs. For example, you will not see the return-if-unchanged calculated on a position that includes options on both Treasury-bond and Treasury-note futures.

Expected Return

The *expected return* is the possible return weighted by the probability of the outcome. Theoretically, you will receive the expected return from this strategy or trade. You might not receive on this particular trade but should expect to get in over a very large number of trades. In effect, you are looking at the trade from the perspective of the casino owner: You know you might lose on this particular bet, but you anticipate winning after hundreds or thousands of bets have been made.

The most common way to calculate the expected return is to take the implied volatility and compute the probability of various prices based on the implied volatility (see Chapter 5 for more details). It is assumed that prices will describe a normal bell-shaped curve (though scientific studies suggest this is not accurate, it is usually close enough for virtually all option strategies). The precise math is beyond the scope of this book, but the following is a simple illustration of the principle: Assume that the expected distribution of prices, as suggested by the implied volatility, suggests that the chances are 66 percent that prices of Widgeteria will stay within a range of \$50 to \$60. Your position has been constructed to show a profit of \$1,000 if prices stay within that range. There is a 16.5 percent chance of prices trading above \$60 and a similar chance of prices trading below \$50. You will lose \$1,000 if prices move above 60 or below 50. Your expected return is, therefore, the sum of the potential profits and losses multiplied by their respective chances of happening: $(0.66 \times 1{,}000) + (0.165 \times -1{,}000) + (0.165 \times -1{,}000)$, or \$330.

Another example looks at the expected return from the perspective of just the price of the UI and what it implies for the price of the option. Make the absurd assumption that the price of Widgets R Us can only trade at a price of \$50 or \$60 at expiration and that the current price is \$55. Further assume that your study of implied volatility suggests that there is a 60 percent chance of prices ending at \$60 and a 40 percent chance of ending at \$50. The expected return from this position is $(0.60 \times \$5) + (0.40 \times -\$5)$, or $\$3 - \$2$, or \$1. This would then be a good value for an option, given all other things being irrelevant.

The delta of an option is a very good approximation of the chance that an option will end in-the-money. This is not technically true but is close enough for even the most picky of arbitrageurs.

This type of analysis has the advantage of acknowledging that different strategies will have different variability of returns. The return-if-unchanged can look identical for two completely different strategies that diverge wildly as soon as the price of the UI moves away from unchanged. At the same time, it has the same advantage of being neutral to the future direction of the market. It assumes that there are equal chances of the market climbing as falling. As a result, it is recommended that option strategists try to concentrate on using this form of analysis if they have the capability to calculate the expected return.

Return-per-Day

The return-per-day is the expected return each day until either expiration or the day you expect to liquidate the trade. For example, you might be comparing two covered call writing programs and want to know which one is best. Take the expected return and divide by the number of days until expiration. That way, you can compare two investments of differing lengths.

Once again, the variability of possible returns can vary widely from the simple case presented here. The return-per-day should only be considered a starting point, much the same way that the return-if-unchanged is a starting point.

The best strategies to use the return-per-day are the strategies that are more arbitrage or financing related, such as boxes or reversals. The variability of the possible outcomes is fairly limited, so the return-per-day makes more sense.

CHAPTER 4

Advanced Option Price Movements

ADVANCED OPTION PRICE MOVEMENTS

The concepts outlined in this chapter form the basis for the option strategies in Part Two. These concepts expand on the basics in Chapter 3. They are not necessary for most traders who are mainly looking at option strategies to hold to expiration.

The first topic in this chapter will be a quick introduction to option pricing models, particularly the Black-Scholes Model. Also discussed will be the *greeks* and how they affect the price of an option; probability distributions and how they affect options; option pricing models and their advantages, disadvantages, and foibles and using them. The final major topic will be the concept of *delta neutral*, which is a key concept for many of the advanced strategies in this book.

Which option should you buy? What if you are looking for the price of Widget futures to move from 50 to 60 over the next four months? Do you buy the option that expires in three months and roll it over near expiration? Or do you buy the six-month option and liquidate it in four months? The answer to these questions is whichever option maximizes profit for a given level of risk.

To decide on an option, you need to find the fair value and characteristics of the various options available for your preferred strategy. You need to find out which option provides the best value, which requires an ability to determine the fair value of an option and to monitor the changes in that fair value. You must be able to determine the likely future price of that option, given changes in such critical components of options prices as time, volatility, and the change in the price of the underlying instrument (UI).

OPTION PRICING MODELS

Option pricing models help you answer key questions:

- What is a particular option worth?
- Is the option over- or undervalued?
- What will the option price be under different scenarios?

Option pricing models provide guidance, not certainty. The output of an option pricing model is based on the accuracy of the model itself as well as the accuracy and timeliness of the inputs.

Option pricing models provide a compass to aid in evaluating an option or an option strategy. However, no option model has yet been designed that truly takes into account the totality of reality. Corners are cut, so only an approximation of reality is represented in the models. The model is not reality but only a guide to reality. Thus, the compass is slightly faulty, but having it is better than wandering blindly in the forest.

Option pricing models allow the trader to deal with the complexity of options rather than be overwhelmed. Option pricing models provide a framework for analysis of specific options and option strategies. They give the strategist an opportunity to try out "what if" scenarios. Although option pricing models are not 100 percent accurate, they provide more than enough accuracy for nearly all option trading styles. The inability to account for the last tick in the price of an option is essentially irrelevant for nearly all traders. On the other hand, arbitrageurs, who are looking to make very small profits from a large number of trades, need to be keenly aware of the drawbacks and inaccuracies of option pricing models. They must look at every factor through a microscope.

One early book that was related to options pricing was *Beat the Market* by Sheen Kassouf and Ed Thorp. This book sold very well and outlined a method of evaluating warrants on stocks, which are essentially long-term options on stocks. However, these models that came before the Black-Scholes Model are rarely mentioned today mainly because of two factors: (1) they were not arbitrage models; and (2) options were not popular, so few traders or academics were paying attention to options pricing problems.

Arbitrage Models

An *arbitrage model* is a pricing model in which all the components of the model are related to each other in such a way that if you know all of the components of the model but one, you can solve for the unknown component. This applies to all of the components. It ties up all the factors relating to the pricing of an option in one tidy package.

Furthermore, an arbitrage model is a model that prices the option, given certain inputs, at a price where the buyer or seller would be ambivalent between the UI and the option. For example, a thoroughly rational bettor would be ambivalent between being given $1 or putting up $1 with another bettor and flipping a coin to see who wins the $2. The expected return from both of these deals is $1.

An arbitrage model attempts to do the same thing. The expected return from, say, owning 100 shares of Widgetmania at $50 should be exactly the same as owning an option to buy the same shares.

There are many different option pricing models. The most popular is the Black-Scholes Model. Other models for pricing options are:

- Cox-Ross-Rubenstein (or Binomial) Model
- Garman-Kohlhagen Model
- Jump Diffusion Model
- Whalley Model
- Value Line Model

Each model takes a look at evaluating options from a different perspective. Usually the goal of the model is to better estimate the fair value of an option. Sometimes the goal is to speed up computation of the fair value.

Black-Scholes Model

The first arbitrage model is the most famous and most popular option pricing model—the Black-Scholes Model. Professors Stanley Black and Myron Scholes were fortunate that they published their revolutionary model just as the Chicago Board Options Exchange (CBOE) was founded. The opening of the CBOE shifted the trading of options from a small over-the-counter backwater of the financial community to a huge and growing market and created a demand for greater information about options pricing. The Black-Scholes was deservedly at the right place at the right time.

The initial version of the Black-Scholes Model was for European options that did not pay dividends. They added the dividend component soon after. Mr. Black made modifications to the model so that it could be used for options on futures. This model is often called the Black Model. Mark

Garman and Steven Kohlhagen then created the Garman-Kohlhagen Model by modifying the Black-Scholes Model so that it gave more accurate pricing of options on foreign exchange. All of these versions of the Black-Scholes Model are similar enough that they are often simply described generically as the Black-Scholes Model.

Another popular model is the Cox-Ross-Rubenstein, or Binomial, Model. This model takes a different approach to the pricing of options. However, many option traders feel that it is generally more accurate than the Black-Scholes Models. The main drawback, however, is that it is computationally more time consuming.

The Black-Scholes Model is used only for pricing European options. Yet most options traded in the world are American options, which allow for early exercise. It has been found, however, that the increase in accuracy from using a true American-pricing model is usually not worth the greater cost in computational time and energy. This is particularly true with options on futures.

Arbitrageurs will sometimes shift to an American pricing model when a stock option gets near expiration or becomes deep in-the-money. These are the circumstances when the chances of early exercise become more likely and the greater accuracy of a model that prices American-style options becomes more important.

Another apparent oddity is that the Black-Scholes Model does not price put options, only calls. However, the price of a put can be found by using the model to price a call and using the put-call parity principle.

The Black-Scholes Model assumes that two positions can be constructed that have essentially the same risk and return. The assumption is that, for a very small move in either of the two positions, the price of the other position will move in essentially the same direction and magnitude. This was called the *riskless hedge* and the relationship between the two positions was known as the *hedge ratio*.

Generally speaking, the hedge ratio describes the number of the underlying instrument for each option. For example, a hedge ratio of 0.50 means that one half of the value of one option is needed to hedge the option. In the case of a stock option, a hedge ratio of 0.50 would mean that 50 shares of the underlying stock are needed to hedge one option. In the case of an option on a futures contract, a hedge ratio of 0.50 would mean that one half of a futures contract is needed to hedge the option. Clearly, one cannot hold only one half of a futures contract, but that is how many would be needed to theoretically hedge the option on that futures contract.

The Black-Scholes Model assumes that the two sides of the position are equal and that an investor would be indifferent as to which one he or she wished to own. You would not care whether you owned a call or the UI if the call were theoretically correctly priced. In the same way, a put would be a substitute for a short position in the UI. This was a major intellectual breakthrough. Previously, option pricing models were based more on observing the past rather than strictly and mathematically looking at the relationship of the option to the UI.

An arbitrage model relies heavily on the inputs into the model for its accuracy. Designing a model using gibberish for inputs will lead to a model that outputs gibberish. The Black-Scholes Model takes these factors into account:

- Current price of the UI
- Strike price of the option
- Current interest rates
- Expected volatility of the UI until expiration
- The possible distribution of future prices
- The number of days to expiration
- Dividends (for options on stocks and stock indexes)

Given this information, the model can be used to find the fair price of the option. But suppose the current price of the option was known, and what was wanted was the expected volatility that was implied in the price of the option. No problem. The Black-Scholes Model could be used to solve for the expected volatility. The model can be used to solve for any of the listed factors, given that the other factors are known. This is a powerful flexibility.

A further advantage of the model is that the calculations are easy. The various factors in the model lend themselves to easy calculation using a sophisticated calculator or a simple computer. The calculations with other models, which might give better results, take so long that they have limited use. Option traders are usually willing to give up a little accuracy to obtain an answer before the option expires!

The Black-Scholes Model is the standard pricing model for options. It has stood the test of time. All of the examples in this book, and virtually all other books, are derived using the Black-Scholes Model. However, the model has some drawbacks. As a result, the model is no longer the standard for options on bonds, foreign exchange, and futures, though the standard models for these three items are modifications of the original.

Assumptions of the Black-Scholes Model

Examining the assumptions of the Black-Scholes Model is not done to criticize the model but to identify its strengths and weaknesses so that the strategist does not make a wrong move based on a false assumption.

Current Price of the UI The current price of the UI is usually known with some certainty for most option traders. They can look on the screen or call their broker and get a price for the UI. It usually does not matter if the price quote is a little wrong.

However, arbitrageurs often have a problem determining exactly what the price of the UI is. They ask: How wide is the bid/ask spread? Is the last trade on the bid, in the middle, or on the ask? Has the bid/ask spread moved since the last trade? Are prices extremely volatile, and will I have a hard time executing a trade at the current bid or ask because the bids and offers are moving so much?

The Strike Price of the Option Fortunately, this one factor is stable and does not change significantly. Strike prices for stock options do change whenever there is a stock split or a stock dividend.

Interest Rates The Black-Scholes Model assumes that setting up the right relationship between the UI and the option will lead to a neutral preference by the investor. The value of the UI and the value of the option will be balanced because the Black-Scholes Model is an arbitrage model.

The model assumes that the so-called risk-free rate is the proper rate. Traditionally, the risk-free rate is considered the rate paid on U.S. government securities, specifically, Treasury bills, notes, and bonds.

To make the model work, it is assumed that interest is being paid or received on balances. It is assumed that all positions are financed, an assumption that is reasonable because there is always an opportunity cost even if the position is not financed. The Black-Scholes Model assumes that you would invest your money in Treasury bills if you did not invest it in an option.

The term of the interest rate used in the model should be the term to expiration of the option. For example, if you are pricing an option that matures in 76 days, then you should theoretically use the interest rate corresponding to a Treasury bill that matures in 76 days. In the real world, of course, you would simply select a Treasury bill that matures close to that perfect number of days.

The problem is that the model assumes that you both invest your money and borrow money at the risk-free rate. It is quite reasonable to assume that you will invest your money in Treasury bills in the real world. However, only the U.S. government can borrow at the Treasury-bill rate. All other borrowers must pay more, sometimes much more. As a result, some options traders assume that they invest at the Treasury-bill yield but that they borrow at the Eurodollar yield or at the prime rate. In general, the rate assumed in the model will have little effect on the price of the option. The level of interest rates mainly affects the price of multiyear options.

Probability Distribution The *probability distribution* is the expected future possible distribution of prices, that is, the probability that any price will occur in the future. The model basically assumes that prices are randomly distributed around the current price in roughly a bellshaped curve. (This is covered in detail in Chapter 5.)

Expected or Implied Volatility *Expected volatility* is the volatility of the price of the UI expected in the future by the investor or the market. Expected volatility is the width of the bell curve mentioned in the preceding paragraph. (This is covered in detail in Chapter 5.)

Days to Expiration Fortunately, the number of days to expiration of the option does not change.

Taxes The Black-Scholes Model does not take into account the effect of taxes on the pricing of options. In fact, no major model does. This is not a major problem, but it might affect some arbitrageurs. For example, it was shown that the model assumes the risk-free or T-bill rate as the interest rate, but that is not usually the case in the real world: The investor might be receiving T-bill interest, which is exempt from state and local taxes, but paying the equivalent of Eurodollar rates or even the prime rate. The investor might or might not be able to deduct the cost of the borrowing from the proceeds of the trade.

Some traders will be taxed differently on the interest or dividend income than on the gain or loss from the option. Interest and dividend income are usually ordinary income, whereas gains and losses from options are capital gains and losses.

Taxes are an important subject but beyond the scope of this book. Variations in taxes could have an impact on the fair price of an option for a particular trader.

THE GREEKS

The price of an option is sensitive to several different factors. The so-called *greeks* are the measures of the various sensitivity factors, as shown in Table 4.1.

Technically, vega is not a Greek letter, so some academics use kappa or zeta instead to designate expected volatility. However, most traders use vega, so that term will be used in this book.

The greeks are useful for describing what will happen to the price of an option given changes in any of the major influences on options prices. Further, they can be used to describe the sensitivity of a complex position

TABLE 4.1 The Greeks

Greek	Sensitivity factor
Delta	Underlying instrument price
Gamma	The delta
Theta	Time
Vega	Expected volatility
Rho	Interest rates
Phi	Foreign interest rates

combining many options or underlying instruments. However, recognize that they only describe the sensitivity of the option or option position at that minute. It is important to remember that changes in each of the greeks will change the other greeks. For example, a change in the theta of a position will change the gamma.

This means that the options traders must not become fixated on the current sensitivities but must constantly remind themselves that these are dynamic sensitivities. The trader must effectively look into the future, seeing the potential changes in the sensitivities and their effects on the other sensitivities and what the net change is in the value of the option. This can be done through a laborious process of contruction of sensitivities of an option or strategy under many different scenarios. Unfortunately, there could easily be an infinite number of possible scenarios, but there is definitely a finite amount of time for decision making.

One of the necessary skills of the options trader is defining only those scenarios that are likely to occur. Many skillful options traders can essentially figure out the probable outcomes in their heads. Perhaps they do not calculate the probable outcome to two decimal places, but they get a good idea quickly. This type of skill comes mainly from extensive experience.

Delta

Delta is the sensitivity of the price of the option to changes in the price of the UI. It is usually given as a number between zero (0.0) and one (1.0). A delta of 0.50 means that the option price will move 50 percent of the move of the price of the UI.

Calls have positive deltas and puts have negative deltas. This means that if the price of the UI climbs, the price of a call will climb, but the price of a put will fall. Conversely, if the price of the UI declines, the price of a call will decline, but the price of a put will climb. For example, a move of 3 points in the price of United Widgets will mean a move of 1.5 points in the price of the call if the option has a delta of 0.50. At the same time, the equivalent put will suffer a decline in price of 1.5 points.

Deep in-the-money options have deltas approaching one, and deep out-of-the-money options have deltas approaching zero. All other things being equal, deltas change over time. At-the-money options change very little, but out-of-the-money and in-the-money options change more substantially.

Consider the following example: Assume that the strike price is 50, expected (or implied volatility) is 20 percent, interest rate is 6 percent, and the dividend yield is 2 percent. The option is a European option. Table 4.2 gives the delta of this option at various prices of the underlying instrument and different days to maturity.

Notice that the change in the delta from 60 days to 10 days is only 0.0271 for the at-the-money option (price = 50). However, the delta declines 0.1182 for the out-of-the-money option (price = 45) and 0.0981 for the in-the-money option (price = 55).

The delta gives the hedge ratio. For example, a delta of 0.33 means that the option will move 33 percent as much as the UI. This means that you will need three options to equal the price movement of one UI. Thus, you will need three options to hedge the price movement of one UI.

The absolute value of a delta is approximately the chance that it will expire in-the-money (the *absolute value* of a number is the number without the sign). Interest and dividends distort this slightly. For example, a put with a delta of −.78 has approximately a 78 percent chance of expiring in-the-money, all other things being equal. (Theoretically, calls cannot have negative deltas, and puts cannot have positive deltas.)

It is common slang to use "deltas" to describe stock option positions but actual positions for everything else. For example, a delta of 0.50 is often referred to as "50 deltas." Thus, 100 deltas is equivalent to one of the UI. A position of −200 deltas would be short, for example, 200 shares of stock or two futures contracts.

TABLE 4.2 Sensitivity of Delta to Time

Days to expire	UI price 45	UI price 50	UI price 55
60	0.1191	0.5466	0.8997
50	0.0944	0.5427	0.9165
40	0.0677	0.5384	0.9360
30	0.0399	0.5334	0.9582
20	0.0146	0.5274	0.9813
10	0.0009	0.5195	0.9978

Gamma

Gamma is the sensitivity of the delta to the change in the price of the UI. For example, a delta of 50 and a gamma of 5 means that the delta will be 55 after the UI moves one point.

The gamma is the curve in the delta on the option chart. This means that gamma is highest in the middle of the curve, which is at-the-money. The gamma goes down as the option moves into or away from the money.

Theta

Theta is the sensitivity of the price of the option to time. This is usually called time decay and is usually measured in dollars-per-day time decay. For example, a theta of −10 means that the position will lose $10 per day. It is always negative because time decay only moves in one direction.

Rho

Rho is the sensitivity of an option's price to a change in interest rates. Rho is typically the least important greek because options are usually too short-lived and interest rates are too low to have a major effect on the price change of an option. However, rho will have a large impact on the price of long-dated options, such as LEAPS and over-the-counter options that are long dated. Rho will also have a major impact on the price of options in countries with very high interest rates. For example, annual interest rates of 60 percent will have a major impact on option prices.

Phi

Phi is the sensitivity of an option to changes in foreign interest rates. This is only used in foreign exchange options. It has no impact on any other options. Foreign exchange options are affected by phi because options are priced on the forward price of the instrument. Usually, the forward price of an instrument is known by simply knowing the interest rate to the date of expiration.

However, foreign exchange is actually composed of two different instruments. For example, a call on dollar/yen is also a put on yen/dollar. To compute the forward price of the dollar versus the yen, the difference in their interest rates to the expiration date must be known. For example, assume that U.S. interest rates are 7 percent and Japanese interest rates are 3 percent. The forward price of the dollar in one year will be the spot price of the dollar/yen times the difference in the interest rates. This means that the one-year forward price of the U.S. dollar will be 4 percent lower than the spot price.

DESCRIBING AN OPTION STRATEGY

Two different ways to describe an options strategy have been shown: (1) simply list the various options and UIs; (2) draw a graph showing the profit and loss at expiration or at intermediate points of time. There is also a third way to look at an options strategy. This method assumes that you have an options pricing model powerful enough to describe each option's delta, gamma, vega, theta, and perhaps rho and phi. Calculate the greeks for each option or UI in the strategy, and then place them in a spreadsheet format with a net total at the bottom.

First, you must know what the characteristics of each component of the option strategy are. Table 4.3 shows the three basic components of an option strategy: the UI, calls, and puts. It then shows if the option is long or short the relevant greek.

Table 4.3 assumes that you are long each of these instruments. Thus, the sign for each would be reversed if you are short the instrument.

For example, assume that you are only long a call with the attributes in Table 4.4.

This call is obviously slightly in-the-money. You can see that the sign of all of these greeks, except the theta, is positive. Table 4.4 shows that the price of the option will climb 0.54 points for every point climb in the UI. The delta will climb 0.0974 for every point climb in the UI. The position will lose $5.57 every day. There will be a gain of $8 for every 1 percent climb in the vega. An interest rate hike of 1 percent will create a profit of $4.13.

Table 4.5 is the same table for being short the exact same call. Notice that this is exactly the opposite of the long call position.

A more complex strategy composed of several instruments can now be described. Look at a bull call spread combined with a short position in

TABLE 4.3 Attributes of Instruments

Name	Delta	Gamma	Theta	Vega	Rho
UI	+	None	None	None	None
Calls	+	+	−	+	+
Puts	−	+	−	+	+

TABLE 4.4 Long Call Position

Name	Delta	Gamma	Theta	Vega	Rho
Long call	0.54	0.0974	−5.57	8.00	4.13

Widget futures. Assume the futures are trading at 50 and the options have 60 days left until expiration.

Table 4.6 takes the attributes of each of the components of the strategy and totals them at the bottom. It is important to make sure that the sign for each position is accurate; note that the short and long calls have different signs. This, then, shows the sensitivity of the total position to the various greeks—how the total position will respond to changes in price, time, implied volatility, and interest rates.

This is the usual way that professional traders and dealers look at their position. They want to know how the *total* position will respond rather than how each separate component will react.

Of course, this Table 4.6 only shows the sensitivities for a short period of time. It should be updated continually. Some traders update the table daily, whereas others use a real-time system to keep it constantly updated.

THEORETICAL EDGE

Theoretical edge is the difference between what the option trader believes to be the theoretical fair value and the current price. For example, assume that the trader has ascertained, through the judicious use of an option pricing model, that a call on the December Widget futures contract is worth 2.65. However, the call is trading at only 2.55. The theoretical edge is 0.10.

Many option strategies exist largely to exploit this concept. They simply attempt to buy undervalued options and sell overvalued options. The option trader then attempts to hedge out all other forms of risk and reward. This is easier said than done. Virtually all trades have some other forms of risk and reward attached to them. The trick is to manage these other risks and rewards such that they do not hurt your core position.

Usually the difference between the theoretical edge and the current price of the option is very small. As a result, it is imperative that the option

TABLE 4.5 Short Call Position

Name	Delta	Gamma	Theta	Vega	Rho
Short call	−0.54	−0.0974	5.57	−8.00	−4.13

TABLE 4.6 Short Futures/Long Bull Spread

Name	Delta	Gamma	Theta	Vega	Rho
Short Widget futures	−1.00	0.00	0.00	0.0	0.00
Short 1 call 60 strike	−0.01	−0.01	0.42	−0.7	−0.11
Long 1 call 55 strike	0.13	0.05	−2.54	4.2	1.00
Total	−0.88	0.04	−2.12	3.5	0.89

trader who is attempting to use the concept of theoretical edge use accurate carrying and transaction costs. For example, it is important to assume that the bid/ask spread will be lost and that the money cannot be borrowed at the risk-free rate.

Much of the theoretical price of an option is based on the trader's ideas of future market movements or at least the expected possible shape of the future market movements. As a result, it is critical that the trader be sure to understand the strengths and weaknesses of the probability distribution that is assumed in the particular options pricing model being used.

There are two main situations that cause traders to consider the theoretical edge: (1) all of the options in a single maturity are mispriced, or (2) only some of the options are mispriced.

In the first situation, traders believe that all of the strike prices of a given maturity are overpriced and should be sold, or they are underpriced and should be bought. For example, assume that you are looking at Amalgamated Widget stock currently trading at $50 per share with a 2 percent dividend. Table 4.7 shows the option greeks with 30 percent implied volatility for all options and 40 days to expiration.

Suppose you believe that the volatility implied in these options should be 40 percent rather than the current implied volatility of 30 percent.

TABLE 4.7 Option Prices and Greeks

Strike	Theoretical price	Delta	Gamma	Theta	Vega	Rho
35	15.12	99.77	0.000	−1.09	0.01	3.81
40	10.17	98.82	0.005	−1.95	0.43	4.31
45	5.50	87.40	0.041	−6.05	3.38	4.19
50	2.08	53.62	0.080	−9.93	6.56	2.71
55	0.51	19.28	0.060	−6.55	4.53	1.00
60	0.08	4.07	0.020	−2.05	1.44	0.21
65	0.01	0.54	0.003	−0.36	0.26	0.03

TABLE 4.8 Theoretical Prices

	Implied Volatilities		
Strike	**20%**	**30%**	**40%**
35	15.12	15.12	15.13
40	10.15	10.17	10.26
45	5.25	5.50	5.90
50	1.43	2.08	2.74
55	0.13	0.51	1.01
60	0.00	0.08	0.30
65	0.00	0.01	0.07

Table 4.8 shows the value of these options with implied volatilities of 20 percent, 30 percent, and 40 percent.

Table 4.8 shows that the value of the at-the-money and near-the-money options will be modestly higher if the implied volatility rises to 40 percent. Assume that you buy the at-the-money option, the 50 strike, at the current price of 2.08. Your theoretical edge on this trade is 0.66, which is the theoretical price of 2.74 minus the current actual price of 2.08.

The usual trade designed to capture this type of theoretical edge is a straddle composed of buying the at-the-money call and the at-the-money put (see Chapter 21). There is no guarantee that you can capture the theoretical edge. It is quite possible that the implied volatility will decline to 20 percent and you will lose on the trade.

You would sell the straddle (sell the at-the-money call and sell the at-the-money put) if you believe that the value of the options is too high. In other words, you would sell the straddle if you believe that the future implied volatility will be less than the current price implies. Professional traders will keep these straddles *delta-neutral.* (This very important subject will be discussed later in this chapter.)

The second major situation in which to use the concept of theoretical edge is for looking at differences in implied volatilities to see if some of the options are mispriced. Table 4.9 shows the implied volatilities of a series of options.

You do not need to have an outlook for the future of volatility to see that the implied volatility of these options is skewed. In this case, the at-the-money option has the lowest implied volatility, while the deep in-the-money and deep out-of-the-money options have the highest implied volatility. This is commonly called a “smile” because it is higher at the ends and lower in the middle.

TABLE 4.9 Implied Volatilities

Strike	Implied volatility
35	35
40	33
45	30
50	27
55	31
60	33
65	37

Most implied volatility curves are basically flat, with little separating the various strikes. On occasion, however, the volatility curve becomes skewed, usually in a smile.

It is usually professional options traders that attempt to make money from these discrepancies. The discrepancies are usually small enough that it requires very low transaction costs to make a profit. In addition, it often requires a significantly large size portfolio to adequately hedge the position in a delta-neutral manner (see the section on delta neutral on page 54).

The usual strategy used to capture the profit opportunity is the ratio spread. In this case, you would sell two of the farthest out-of-the-money options that are overpriced and buy one of the options with the lowest implied volatility. Using the example in Table 4.9, you could consider buying one of the 50s while selling two of the 65s. You would then use futures to make the position delta neutral. You would make money if the discrepancy between the two strikes disappears.

NEUTRAL STRATEGIES

One of the key concepts of options traders is the concept of a *neutral strategy*, that is, any strategy that aims to neutralize one of the greeks. A delta-neutral strategy, mentioned in the previous section, is the most common type of neutral strategy. Such a strategy has no effective exposure to changes in the price of the UI. This means that the total value of the strategy will not change, given changes in the price of the UI. In effect, the delta of the option or the UI has been hedged away.

Less common is the hedging away of other greeks. Options traders do not usually talk about theta, gamma, or vega neutral, though virtually any of the following discussion of delta neutral could also apply to hedging out of any of the greeks.

The idea of neutralizing a strategy from one of the greeks is to construct a position that capitalizes on changes in one of the other greeks. The most common example is to make a position delta neutral in order to speculate on changes in implied volatility, or vega.

Delta Neutral

Delta neutral is an important concept for options trading. It means that the net delta of the option strategy, including positions in the UI, is neutral and has no market bias.

The delta of a UI is always 1.00 if you are long that instrument. An at-the-money option on that UI will have a delta of about 0.50. If you construct a covered write, for example, by buying the UI and selling one call, your net delta is 0.50. Shorting the call changes the delta of the call from positive to negative, so the net delta is computed by taking the delta of the UI, 1.00, and subtracting the delta of the option, 0.50. This position could be changed to a delta-neutral position by selling another call with a delta of 0.50. The total delta of the short option would be 1.00, exactly offsetting the 1.00 delta of the long instrument. Thus, this position would be delta neutral and have no market bias.

Usually, delta neutral trading is done to capture a premium or to speculate in changes in implied volatility. Table 4.10 illustrates a more complex strategy:

In this case, you are short 100 of the at-the-money put options and short 284 of the out-of-the-money call options for a total credit of 35.284. Your job will be to try to capture this premium. You hope that the price of the UI stays about unchanged so that you can capture the premium.

What typically happens is that the price of the UI moves around, throwing the position away from delta neutral. You then have to rebalance the position by buying and/or selling UIs. This then causes trading losses that reduce the profits of the initial position.

TABLE 4.10 Short Strangle

Position	Quantity	Price	Delta	Total Delta	Gamma	Total Gamma
Short April $50 puts	−100	2.08	0.54	54.00	0.08	−0.08
Short April $55 calls	−284	0.51	0.19	−53.96	0.06	−17.04
Net Position				0.04		−25.04

This position is essentially delta neutral. But look at the gamma. This shows that the position will shift significantly long or short as soon as the UI moves because the position is not gamma neutral. In this example, the total position is short gamma, which means that you will become short the market if the UI price climbs but long the market if the UI price falls. This position starts out as delta neutral but soon shifts to either net long or net short because of the action of the gamma. This means that additional trades must be made to force the trade back to delta neutral.

The usual process is to use the UI to bring the position back into line. For example, assume that the position moved in such a way as to drive the position to a net delta of +1.00. This position could be rebalanced by selling short 100 shares of stock, which is equal to one option. Your total overall position would now be delta neutral.

The profit or loss on a delta-neutral strategy is equal to the profit/loss on the initial option position plus the profit/loss on the ensuing hedge plus/minus the interest on the margin deposits. In the following two examples, assume that interest profit/loss is not involved, and focus on the main profit/loss issue: rebalancing.

Using the data in Table 4.10 again, assume that these are options on the Widget Stock Index (the index of stocks in the widget industry). The price of the underlying index is $50 when the trade starts, and the delta and gamma of the position are as in Table 4.10. Table 4.11 gives the situation after the index has dropped one point.

You are now long the market by just over 21 contracts due to the decline in price of the underlying index. You need to bring the position back to delta neutral, or you will lose money as the market declines. You are long now and will continue to get longer as the market declines, creating larger and larger losses. So the obvious solution is to sell 21 contracts of the Widget Index futures at the current price of $49. This would then lead to the position shown in Table 4.12.

The position is now delta neutral though the position still has a net gamma position.

Now assume that the price moves back to the starting point of $50. That means that you are now losing $1 on the 21 contracts that you sold. In

TABLE 4.11 Short Strangle

Position	Quantity	Delta	Total Delta	Gamma	Total Gamma
Short April $50 puts	−100	0.58	58.00	0.07	−7.00
Short April $55 calls	−284	0.13	−36.92	0.05	−14.20
Net Position			21.08		−21.20

TABLE 4.12 Rebalanced Short Strangle

Position	Quantity	Delta	Total Delta	Gamma	Total Gamma
Short Index futures	−21	1.00	−21.00	0.00	0.00
Short April $50 puts	100	0.58	58.00	0.07	−7.00
Short April $55 calls	−284	0.13	−36.92	0.05	−14.20
Net Position			0.08		−21.20

addition, you are now short 21 contracts because the position has moved the deltas of the options back to their original levels. As a result, you must now buy 21 contracts to get back to delta neutral, thus locking in your loss of $1 per contract.

If the price drops back down $1, then you will have to sell 21 contracts again. If the price of the UI goes back up $1 again, then you will once again have a $1 loss on 21 contracts. But if the market drops another $1, then you will have to sell another 21 contracts (because the delta will have moved by 21 contracts due to the gamma being −21.20 in Table 4.12).

Note that you do not make any money on the downside even though you just sold 21 contracts when the market had dropped the initial $1. That is because the sale of 21 contracts puts you back to delta neutral. Yes, you made money on the position of short 21 Widget Index contracts, but you lost an equivalent amount on the net long 21 delta-neutral position of the options. In this case, you lost money on the rebalancing and expected to make money on the initial position. This position started out with a credit for the trader, and the rebalancing ate away at the profit. The trader hopes that rebalancing will not occur often so that the costs of rebalancing do not exceed the initial credit.

There are also positions, primarily strategies designed to make money on increasing implied volatility, that start up with a debit and the trader makes money on the rebalancing. In this case, the trader must have a lot of rebalances in order to make enough money to offset the initial debit. In effect, the trade is the opposite of the preceding example. Long straddles and strangles are the usual methods.

One of the critical decisions for an investor to make is how often to rebalance. The more you rebalance, the higher the transaction costs but the greater the ability of the strategy to stay delta neutral. Transaction costs can mount up when rebalancing a strategy. It, therefore, becomes very important to negotiate low commissions before embarking on such strategies. Also, the higher transaction costs might be offset by the lower trading losses caused by rebalancing.

Typically, professional traders rebalance their positions whenever the UI moves a certain amount, or sometimes they do it every certain number of time periods. For example, you may want to rebalance the position every time the underlying moves $1 or at the end of every day, whichever comes first.

The usually determining factor on the frequency of rebalancing is the transaction costs versus the rebalancing costs. As a result, floor traders can afford to rebalance more frequently than retail traders.

NOT EQUIVALENTS

Even though the expression is *delta neutral*, it is important to realize that no combination of long or short options is the equivalent of or a substitute for a position in the UI (except reversals or conversions; see Chapter 23). All the rebalancing and analysis and arbitrage-based pricing models in the world will not make them equal. If they were equal, there would be no economic need for one of them.

Instruments are relatively simple compared to options. With few exceptions, the profit and loss from a UI is strictly related to the price movement. An option is subject to many more pressures before expiration, and the profit and loss are nonlinear. The current and future prices of an option are functions of several nonlinear forces.

The trader of just UIs is only concerned with the price direction of the UI. An option trader, on the other hand, should take into account price direction, time, volatility, and even dividends and interest rates.

As a result, the option strategy may be delta neutral, but the effects of gamma, vega, theta, and even rho may cause profits and losses that are not expected by the delta-neutral trader. The point is to keep monitoring the potential effects of other greeks before and during a trade.

CHAPTER 5

Volatility

VOLATILITY AND THE OPTIONS TRADER

Volatility is important for the options trader. The expected volatility of the price of the underlying instrument (UI) is a major determinant of the price and value of an option.

Some might not consider it important if they are going to hold the position to expiration. They argue that the option will either be in-the-money or it will not. But it is still important for traders to consider volatility because they might be overpaying for the option or miss an opportunity to buy an undervalued option. In addition, by understanding volatility, they might have insights into the potential for the option to expire in-the-money or out-of-the-money.

Considering volatility is most important for traders who are not expecting to hold their position to expiration, and it is absolutely critical for traders considering theoretical edge or trading volatility (see Chapter 4 for information on these ideas). One *has* to know what the implied volatility is before initiating one of these strategies. One *has* to have an opinion of the future volatility to successfully trade these strategies.

It is possible for traders to ignore volatility in their options trading and still be successful, but it is more difficult. Trading options contains more dimensions than trading the UI. Volatility is perhaps the most important additional dimension.

WHAT IS VOLATILITY?

Volatility is the width of the distribution of prices around a single point. Usually it is the distribution of past or expected future prices around the current price. Prices go up, and they go down. How far up and how far down is the *volatility* of those prices. (Remember that volatility is always expressed as an annualized number, even when the volatility is measured over periods greater or lesser than a year; a formula for de-annualizing volatility is given later in this chapter.)

Historical or *actual volatility* is the annualized volatility of UI prices over a particular period in the past. Were prices highly volatile and moved all over the place or were prices stable and moved within a narrow range? Are prices being checked over the past 10 days? Over the past 20 or 100 days? Or over some period in the past? For example, the annualized volatility of the stock market may have been 10 percent over the past 20 days.

Expected volatility that is expected by the option trader is the annualized volatility of the UI over some period in the future (usually to the expiration of the option). This is a simple projection or expectation. For example, you might think that the volatility of the stock market will be 20 percent over the next six weeks until expiration of the stock index options.

Implied volatility is the volatility implied by the current options price. This can be found by plugging the current price of the option into the Black-Scholes formula (or whatever model is being used) and solving for volatility. Usually, the value for volatility is plugged in and the formula is solved for the value of the option. Here, the situation is reversed—the formula is solved for volatility because the current price is known.

BELL CURVES AND STANDARD DEVIATIONS

The *standard deviation of prices* is a description of the distribution of price changes and a good approximation of actual volatility. The *mean* (commonly called the *average*) of the prices being examined is basically the middle of the distribution. In the option world, the standard deviation is annualized so that various volatilities can be compared on the same scale.

Standard deviation is easier to understand with a diagram and a little more explanation. Figure 5.1 shows the closing prices for a particular instrument, Widgets of America, for the past 60 days. You can see that the prices move around $50 during that period of time.

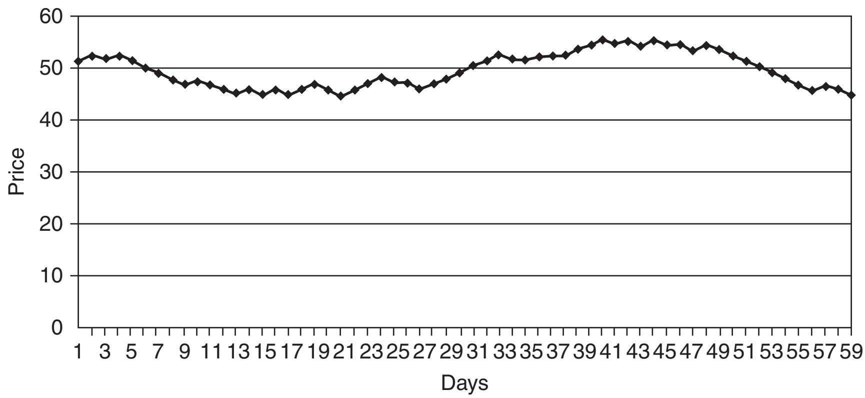


FIGURE 5.1 Daily Prices

Standard statistics can be used to calculate the mean and the standard deviation. The standard deviation is simply the statistical description of the variability around the mean. In this case, the mean is \$49.47, and the standard deviation is \$3.13. This shows that roughly two-thirds of prices will fall within \$3.13 of the mean, \$49.47. In other words, two-thirds of the time, prices can be expected to range between \$46.34 and \$52.60.

Volatility in the option world is defined as this one standard deviation. A volatility of 20 percent says that the price will vary 20 percent around the mean 68 percent of the time on an annualized basis.

The data for examining actual or historical volatility can be precise because they are known. The actual mean and standard deviation can be calculated. The data for expected volatility must be assumptions: that the current price is the mean of the distribution and that prices will be distributed around this mean. It makes sense to assume that prices will be randomly distributed in the future around the current price (the truthfulness of the concept of random price action is discussed later in this chapter).

However, the current price of the instrument should not be the actual current price but actually the forward price at expiration of the option. The carrying charges from now until expiration must be taken into account because carrying charges will cause a drift in the current price to the forward price. This is necessary because the forward price is the economic equivalent of the current price carried forward to the expiration date. The forward price of the instrument is the price that has such carrying costs/benefits as dividends and interest payments built in. Fortunately, carrying charges are built into the Black-Scholes Model.

Statistically, the first standard deviation of prices contains roughly 68 percent of all prices, two standard deviations contain nearly 95 percent of prices, and three deviations contain nearly 100 percent of prices. Just because the price of the UI eventually moves beyond the third standard deviation does not mean that the model or standard deviation was wrong. The standard deviation simply tells what the expectation for the future is as based on the past. This is usually good enough but might not be. Volatility deals with probabilities, not certainties, so traders must make do with standard deviations and assume that occasionally the bizarre will happen.

The standard deviation is based on a sample of the total universe of possible prices and, therefore, is an ultimately inaccurate though reasonable estimate of the attributes of the whole universe. Still, it provides a good working guide because absolute accuracy is not necessary for trading profits.

The standard deviation can be wide or narrow. High volatility means wide distribution, which is illustrated by a wide bell curve. High volatility means that the chances are greater that prices significantly away from the mean will be hit. Low volatility means narrow distribution, which is illustrated by a narrow bell curve. Low volatility means that the chances are less that far away prices will be hit. Figure 5.2 shows a wide distribution that would mean that prices are expected to cover a lot of territory. Figure 5.3 shows a prices series that is going nowhere. And, of course, Figure 5.4 shows a normal amount of range.

One of the critical attributes of a normal distribution is that you can describe all normal distributions knowing only the mean and standard deviation. This is obviously an important advantage for computational speed.

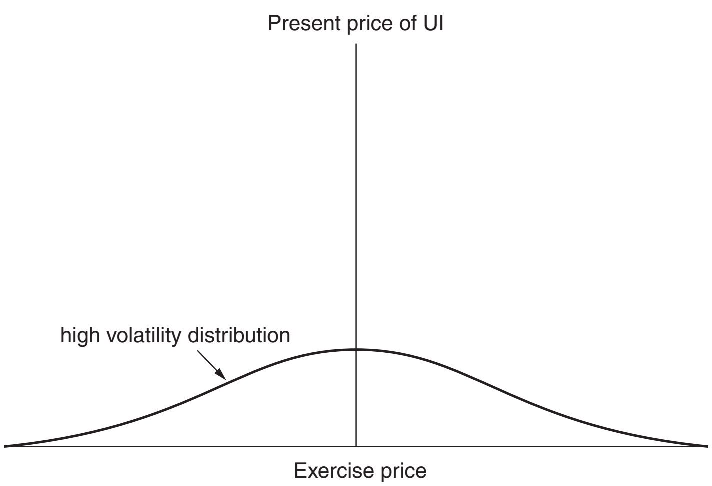


FIGURE 5.2 High Volatility

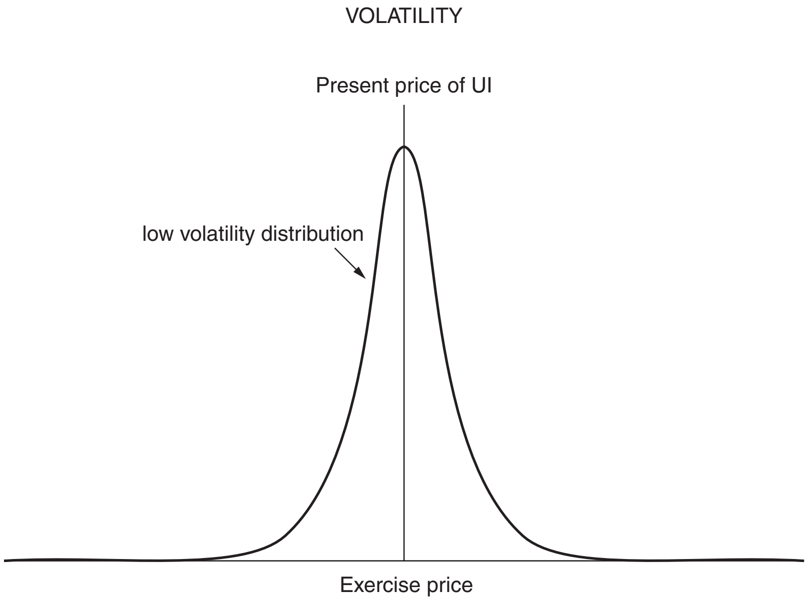


FIGURE 5.3 Low Volatility

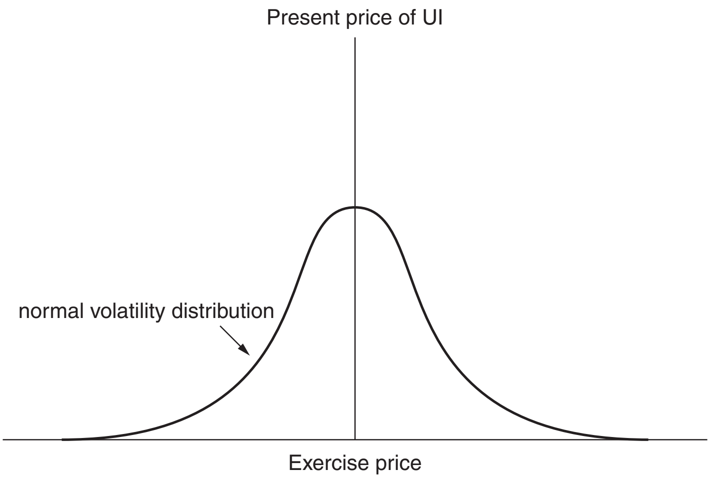


FIGURE 5.4 Normal Volatility

However, the normal distribution is far too inaccurate for options pricing. A lognormal distribution is needed instead.

PROBABILITY DISTRIBUTION

Built into the options-pricing-model equation is an assumption of how the price of the UI will move in the future. The model does not predict the future price behavior but does assume what the probable distribution of those prices will be. It is critical to know what the possible future prices are for the UI. Absolute knowledge that the price of the UI will be at $55 at expiration would be invaluable. Knowing that, for instance, the probabilities are greater than 67 percent that the price will be between $45 and $65 would be valuable but not as valuable as knowing the exact closing price. Thus, the options traders will want to know what the potential future range is of the options that they are trading. This is based on the potential future range of the UI.

The range of prices shown by the usual bell curve in Figure 5.4 is a *normal* distribution. One major feature of a normal distribution is that it is symmetrical. Each side of the curve is identical to the other side. The normal distribution is wrong in the real world. There are two main reasons: First, it allows absurd situations such as negative prices. It seems rather reasonable to assume a 50 percent chance of prices going from 50 to either 49 or 51. But a normal distribution also assumes that the price could just as easily go from 1 to −9 as from 1 to 11. This is not in line with reality. Second, prices of financial instruments are not equally and randomly distributed about the midpoint (the randomness of prices is discussed later). Instead, each instrument has a unique distribution pattern. For example, the price of stock index and stock options has an upward drift to it. Stock prices have moved erratically higher since stocks began trading under the buttonwood tree in Manhattan. Bond prices are mean reverting around par because the bond will mature at 100. Most other instruments, such as currencies and futures, tend to have essentially symmetrical distributions.

LOGNORMAL DISTRIBUTION

Prices of financial instruments follow more closely what is called a *lognormal* distribution. A lognormal distribution does not consider the changes in the absolute points of the underlying distribution but rather the rates of return. For example, a normal distribution outlines the probability of price

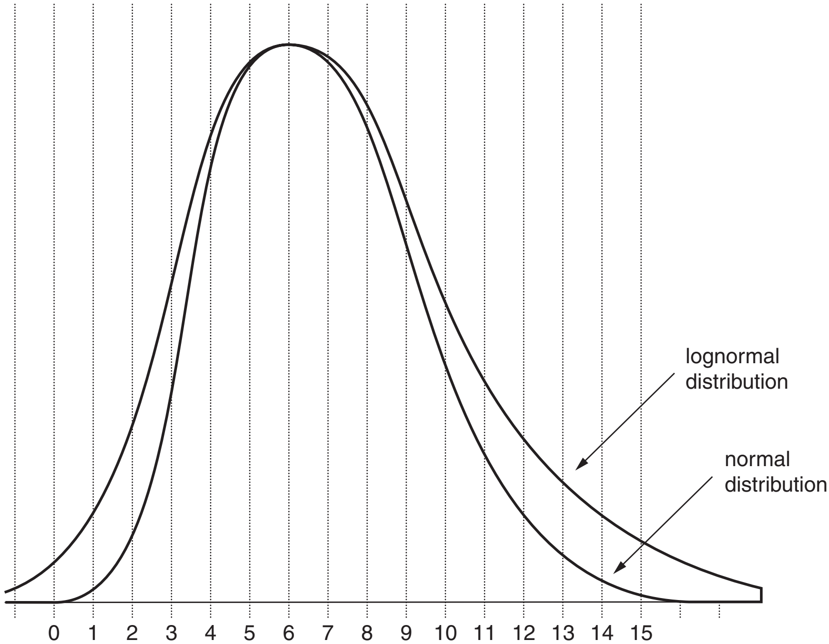


FIGURE 5.5 Lognormal and Normal Distributions

changes from 50 up to 51 or down to 49. A lognormal distribution, on the other hand, looks at this same price movement as a rate of return. It would instead say that there is an equal probability of prices climbing 10 percent from 50 as it is to drop 10 percent from 50. (The Black-Scholes Model uses a lognormal distribution, which is a fairly good assumption for most instruments except bonds.) Figure 5.5 shows the difference between a normal distribution and a lognormal distribution.

But note that this is quite different from looking at absolute changes in price. It is looking at relative changes from the last price. For example, assume that prices drop 10 percent from 50. That would be 45. A lognormal distribution still assumes that prices have an equal chance of climbing or declining 10 percent. Assume that they rise 10 percent from the now current price of 45. The result would be 49.50. The distribution is now no longer symmetrical as far as absolute price changes are concerned, though it is symmetrical as far as percent changes are concerned.

Note also that prices can never drop below zero. Subtracting 10 percent, for example, over and over again from any price will move the price closer and closer to zero but never cause the price to decline below zero. On the upper end, there is clearly no such boundary as zero.

Another aspect of a lognormal distribution is that it means that high strike options will always be worth more than low strike options, even when they are equidistant from the price of the UI. This is due to the fact that the lognormal distribution allows for the price of the UI to go to great heights but to never go below zero. There are, therefore, greater chances of hitting a higher price than a lower price. This skew, or assymetry, means that the 55 call should have a greater theoretical value than the 45 put with the UI price at 50 and assuming all other factors are worthless.

A lognormal distribution is a probable distribution of prices that is very reasonable. In addition, it is also very easy to describe on a computer, thus making it quick and easy to calculate.

THE REALITY OF PRICE DISTRIBUTIONS

It is important to realize that even the lognormal distribution does not correspond to reality. There are two main problems.

The first problem is that empirical studies of actual prices show that price distributions tend to have more extreme prices and more prices clustered around the mean and fewer prices in the intermediate ranges. In effect, the real-world distribution is higher near the center and on the extreme tails but lower in the midrange.

The second problem is that prices are discontinuous. What this means is that prices jump around, sometimes leaving large gaps between one price and the next. A piece of news comes out and the prices of the instruments jump. The Black-Scholes Model, and most other models, assumes that prices are continuous. This means that prices flow logically one after the other. Prices will go from 56.50 to 56.51 without jumping up to 56.52. Of course, this is not true in the real world. There are price gaps, particularly during highly volatile times.

The net result is that the models make assumptions about the real world that are not true. The question is: Does it matter? For most traders, the difference between the assumptions in the Black-Scholes Model and the real world is trivial. Typically, the transaction costs will be greater than the difference implied by the discrepancies in the Black-Scholes Model. The difference will be more important to professional traders and market makers. Much of their trading styles and, hence, profits comes from looking for small discrepancies between what they perceive to be the fair value of the option and the current price. They are very concerned with the concept of theoretical edge that was discussed in the previous chapter. Knowing the most accurate value of the option is critical to this type of trading.

RANDOM PRICES

The Black-Scholes Model and other models assume that prices are random within the constraints of the lognormal distribution. Prices must be considered random for a model but might not be random in the real world. Prices must be random or else the arbitrage condition inherent in most models will not hold.

However, prices must not be considered random, or you will never be able to put on trade. You must think that prices are moving generally in one direction, or you can never put on a directional based trade. You must think that prices will change volatility, or you can never put on a volatility trade. You must think that volatilities are linked, or you can never trade based on volatility skews or theoretical edges.

This means that the options strategist must approach prices from two perspectives: academic and trader. The academic will assume prices are random, whereas the trader will assume that they are not. The strategist must use the concept of random prices to determine if the price of the option is fairly priced or not. However, unless the strategist is a market maker or arbitrageur, the strategist must then reject the notion of randomness in order to project what the future price of the option will be after the price and/or volatility have changed.

The concept of *randomness* only makes sense from the perspectives of market makers, arbitrageurs, and academics. Each of these people cannot make judgments related to the future of the UI or even the expected volatility of the option. They must assume that prices can go essentially higher or lower with equal chances.

However, it is easy to see that prices are not random. Academic tests of randomness set up straw men and then knock them down. On the other hand, there is extensive evidence of seasonality of prices and of implied volatility.

Furthermore, bond prices are not random. Bond prices eventually have to revert to par or 100 at maturity. This means that prices are random when the bond is at 100 but will have a strong negative bias when it is trading at 120 or a strong positive bias when it trades at 80.

HOW TO CALCULATE HISTORICAL VOLATILITY

Historical volatility is the actual volatility of the UI over a predetermined period of time, for example, the previous 30 days. This sample of days is then annualized so that historical volatilities can be compared over different time periods. It is expressed as the annualized standard deviation of prices.

Here is the generalized formula for calculating historical volatility:

$$X_1 = \ln\left(\frac{P_i + D}{(1 + {}^{r}\!/_{52})(P_{i-1})}\right)$$

Typically, historical volatility is calculated over the relatively recent past, for example, the past 10, 20, 30, or 60 days. The idea is that the recent past is a good idea of the near future.

Some people prefer to calculate the historic volatility over the past number of days that is equal to the number of days left to expiration. For example, they will calculate the historical volatility of the past 34 days if there are 34 days left to expiration. One day later, they would calculate the historical over the past 33 days. And so on.

The idea is that they will likely be carrying the options position to expiration and want to know what the likely volatility will be for the coming days to expiration and believe that the same number of days in the past will provide a good clue.

PREDICTING IMPLIED VOLATILITY

The most important factor affecting the price of options is the price of the underlying instrument. Usually, the second most important factor is the implied volatility of the option. This is not true of very short-dated options but is true for the vast majority of options.

I have seen situations where the price of the underlying instrument has gone up but the price of the calls decline because of the decline in the implied volatility of the option. Many options traders have seen similar situations.

One of the major keys of option trading success is determining if an option is over- or undervalued. Normally, over- and undervaluation is determined by looking at the implied volatility of the option.

A person who is consistently buying undervalued options or who is selling overvalued options will have a significant edge in their trading. In fact, being able to correctly identify the valuation of an option will often be the difference between profits and losses. So being able to identify the correct valuation and the future direction of implied volatility is of crucial concern to an option trader.

There are several methods for predicting the future direction of implied volatility. There are classic forecasting techniques, such as regression analysis, time series analysis, and even classic chart patterns such as head and shoulders and trendlines. However, professional options traders will often use the GARCH (Generalized AutoRegressive Conditional Heteroscedasticity) method. A discussion of GARCH is beyond the scope of this book.

Fortunately, there is a simpler method that provides excellent results.

One of the critical aspects of implied volatility is that it is usually mean reverting; that is, option implied volatility oscillates around an average level. Let me put that in plain English: the implied volatility for an option will tend to move up and down within a clear range. The implied volatility in a particular instrument will move around, but within a range. For example, the implied volatility of United Widget has moved in a range of 15 to 45 percent over the past two years with an average or mean of 25 percent. Thus a current implied volatility probably means that implied volatility will be increasing in the future to move back to the average level of 25 percent.

The second consideration is how the implied volatility relates to the historical volatility. In this case, the trader usually looks at the current implied volatility and sees if there is a large difference between the current implied volatility and the recent historical volatility (see Figure 5.6).

Typically, it is bearish for implied volatility if it is significantly above the historical volatility and bullish if it is significantly below the historical volatility.

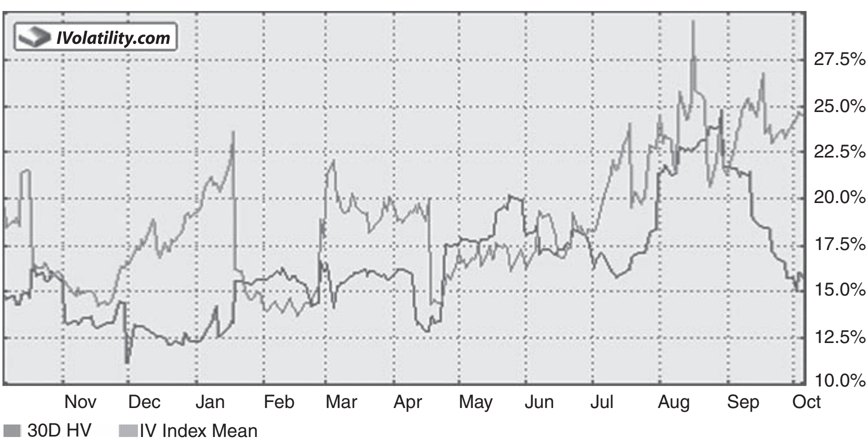


FIGURE 5.6 30 day historical volatility for IBM

Let's take a look at an example. Figure 5.6 shows a chart of the implied and 30-day historical volatility for IBM. Notice how both the implied and historical volatilities have moved within ranges until very recently. Actually, the ranges had extended back more than a year before the point where this chart starts. Let's break down this chart and how to analyze.

First, notice that the implied volatility had been in a range of about 14 percent on the down side and about 23 percent on the top side until near the beginning of August when the implied volatility got up to over 28 percent and then sagged down a little.

Second, note that the historical volatility had been in a range from 12 percent to a high of about 20 percent (that range extends back in time before this chart). Historical volatility is also mean reverting but less so than implied volatility. Here, it moved up to a high in late August but then collapsed through September.

Until August, the implied volatility was well behaved and kept within a well established range.

We look for two conditions to help us determine if the implied volatility is over- or undervalued.

The most important factor is the position of the implied volatility to its range. For example, the implied volatility was just over 22.5 percent in the middle of January. This was right at the top of the range so it was an easy call to be bearish. We would expect the implied volatility to drop to at least the middle of the range, about 18 percent if not move to the bottom of the range at about 14 percent The implied volatility then collapsed and went from the top of the range in the middle of January to the bottom of the range at the end of January.

Conversely, the implied volatility is at the bottom of the range by the end of January. We should expect it to go at least to the middle of the range if not the high end of the range. Sure enough, the implied volatility rallies up to 22 percent over the next month.

Notice that the implied volatility then moves to the bottom of the range from early March to the end of April then back to the top by July. This back and forth pattern had been in place in this range for several years. This made predicting movements in implied volatility easy.

The second factor we want to look at is the relationship of the implied volatility to the historical volatility. This is not as important a factor as the range factor above but it can provide additional confidence to our first analysis.

Here, we are looking for divergences in the implied to the historical implied volatilities. We would normally like to see a wide difference in the implied and the historical. A perfect example is mid-January. Here, the implied is at the high end of its range while the historical is at the low end of its range. This gives us much greater confidence that the implied will drop from its current high level and go to the bottom end of its range.

Our rules are as follows:

- We are looking for implied volatility to decline to at least mid-range or even to the bottom of the range when it is at the high end of its range and above the historical. The wider the divergence between the implied and the historical the better.
- We are looking for implied volatility to climb to at least mid-range or even to the top of the range when it is at the low end of its range and below the historical. The wider the divergence between the implied and the historical the better.
- We are neutral on implied volatility under any other conditions.

It is quite clear from this chart that these rules would have created many profitable predictions in the implied volatility in IBM.

But what if the market is not well behaved? What if we predict that the volatility is going in one direction only to see it move in another. Let's take a look at the period in August on the chart.

The implied volatility had broken above its normal bounds by about 5 percent in August. This was due to the idea that the US was going through a major credit crisis and that the economy was going to go into a recession. At the time, implied volatilities of virtually all stocks moved to new highs. We would have been looking for implied volatility to drop from the 23 percent level in July only to see it move up to a peak of about 28.5 percent in the middle of August.

Breakouts out of the normal range can occur for two reasons. First, and by far the most common, is that there is an anomaly in the market. That was the case here with the market discounting the credit crunch. There was no news specifically about IBM that caused the spike up in implied volatility; it was market related news. It was not a structural change in IBM but a temporary condition.

These are very good opportunities to initiate short implied volatility positions because it is a near certainty that the implied volatility will drop back into the normal range. It is always wise to bet on a return to normalcy when looking at implied volatility.

There generally has to be a structural change in the underlying instrument before you will see a permanent significant change in the range of implied volatility. For example, a major acquisition could permanently change the character of the company's business and therefore change the range of implied and historical volatility.

There are times when you will not see volatilities in a range but in a trend. This is not common but does happen. There are two main circumstances when it occurs.

The first and most common is when an option is initially listed. The market will drift in a trend until it finds its natural range. This can take up to a year before the range becomes clear. It is probably safer to stand aside in this situation.

A second possibility is similar to the situation above where there is a major structural change in the company. This is once again usually a major merger or acquisition or even a major diverstiture.

The ability to predict the future level is critical. Although the price of the underlying instrument is the most important factor affecting the price of an option, implied volatility is usually the second most important factor.

Knowing if the implied volatility is bullish, bearish, or neutral will give you a large edge in the market. For example, if you are bullish on Widget & Sons and are looking for the implied volatility to decline significantly, then you should design your strategy with a short option leg. That way, you should gain an edge in the market.

You should be long options when you are bullish on implied volatility and you can go either long or short if the implied volatility is neutral. This will give you a major advantage over a long time of trading options. You will constantly be raking in at least a minor edge with every trade.

In addition, the ability to predict changes in implied volatility also opens up a whole new asset class to trade. You can now construct trades that will make money solely on changes in implied volatility. You can buy straddles or strangles if you are bullish on implied volatility but sell those same straddles or strangles if you are bearish.

Professional options dealers are often more concerned about the implied volatility in their portfolios than the direction of the underlying instrument.

It is critical to understand how to predict implied volatility. You will gain a constant edge in your trading that will compound through your trading career.

PART TWO

Option Strategies

CHAPTER 6

Selecting a Strategy

Options allow the investor to sculpt the returns in their portfolio. When you buy a stock and the price rises $1, you make $1. You lose $1 if the price declines $1. Your profits are linear and directly related to only the change in the price of the stock. Interest and dividends will make a slight change to the outcome though these factors are also linear. Options blow apart this linearity. Options are called convex instruments because the returns are not linear but curved. We saw that in the previous chapters.

You can literally create millions of possible returns through the use of options. You can mix and match options to create just about any return possible.

Selecting a strategy is a multistep process. You should go through a systematic process before initiating a trade. Each step should lead to further refinement of the strategy. It can be very dangerous to your bank account to disregard some or all of the major factors that affect options prices.

The most important factor that affects option prices is the price of the underlying instrument. But that is usually not the only thing that most investors look at. Only looking at the underlying instrument price can lead to significant losses for the investor. This strategy assumes that the edge that the investor has in stock selection is so superior that he can withstand a lot of headwinds caused by trading an option or options that have a lot of edges against him.

For example, what if the investor is buying a near dated call on U.S. Widget? But what if the options is overvalued and there is little gamma and the time decay is large. Here are three strikes against the investor. I have seen situations where the investor got the direction of the underlying instrument correct but all the other factors wrong and lost money on the trade.

I am reminded of the old admonishment—don't try this at home, kids. Options have a tremendous amount of power but also a lot of risk. So the design of your strategy should be the most important thing in your arsenal. You need to develop a particular frame of mind to trade options.

You need to think multidimensional when you trade options. You must now think about time because options expire and the returns change over time. You need to think in terms of distance. By this I mean you must now consider how far the underlying instrument will move. For example, you may buy an out-of-the-money call that expires in three weeks. This means that you must expect the UI to rally at least up to the break-even point by expiration. This is very different from just owning the UI where you are expecting the UI to rally but you don't need to put a time limit on it. Options require you to consider not only the fact that the underlying instrument will rally but how much and how quickly that rally will occur.

This chapter contains tables that show the main strategies that are the most suitable. One problem with a book like this is that it must, by necessity, simplify. For example, long straddles are usually considered neutral strategies, but they can actually be constructed with a market bias. The tables in this chapter generally refer to strategies as they are usually considered.

OPTION CREATIVITY

The strategies in this book are generally presented in their plain vanilla form. Yet the very nature of options gives greater scope to the creative strategist. For example, one of the interesting aspects of options is that you can combine strategies to create even more attractive opportunities. You could write a straddle and buy an underlying instrument to create a lower break even than by holding the instrument alone or to create greater profits if prices stagnate, but give up some of the upside potential. You should be able to examine a myriad of fascinating strategies after reading this book.

Another feature of options is the ability to twist the expiration and strike prices to fit your outlook. For example, a straddle is constructed by buying a put and a call with the same strike price. That is the plain vanilla. But you can change the strike prices by, say, buying an out-of-the-money put and an out-of-the-money call and create what is called a *strangle*. Or why not buy the call for nearby expiration but the put for far expiration? The net effect is that you have a tremendous tool in options for creating exciting trading opportunities. Do not get stuck in the ordinary.

TRADEOFFS

Of course, the selection of any strategy involves tradeoffs. For every one factor that you gain, you will likely give up another. The choice of one strategy over another largely depends on your personal expectations of the future of the market.

For example, you may believe that implied volatility is going to go higher. Any strategy that is long implied volatility is going to be hurt by time decay. You are assuming that implied volatility will increase quickly and strongly enough to offset the drain on your position due to time decay.

CONSTRUCTING A STRATEGY

There are three main ways to construct a strategy:

1. Use software to filter for different strategies using different criteria.
2. Use a building blocks approach.
3. Use tables such as the ones in this chapter.

We will focus on the latter two. However, we will need to use software to build our strategies using the building blocks approach. The table approach is a rule of thumb or back of the envelope approach.

BUILDING A STRATEGY

There are two major techniques to identifying an appropriate strategy:

1. *Identify your ideas on the major factors that affect options prices*, that is, the greeks. You will need to look at such factors as market opinion, volatility, and time decay. You will then be able to make a statement like, "I think that Widgets will move slightly higher in price, volatility will decline, and time premium will decay rapidly because we are approaching expiration." You can then start to build the strategy.
2. *Systematically rank various option strategies.* This technique can easily be used in conjuction with the first. For example, you may have decided that covered call writing fits your outlook. You now want to rank the covered calls on Widget International by their various risk/reward characteristics. For example, you could rank them by

expected return or perhaps by the ratio of the return if unchanged to the downside break-even point. The main problem with the use of rankings is that you will need a computer to do all the possible mathematical manipulations.

Once again, the basic way to construct a position is to make a decision on the future of the key greeks and the underlying instrument. This will nearly always lead to a final position that meets your scenario. What this means is that you must have an opinion on the future direction of the UI and on the direction and level of the implied volatility. It is best if you also have an opinion on the other greeks since, although they are usually not as important, sometimes they rise to the highest level of importance. Further, it is advantageous to have an opinion on how quickly these expected changes will occur.

For example, suppose you are bullish on Widget Life Insurance. You look for the price of the stock to move from its current $50 per share to $60 per share over the coming three months. This means that you should only look at bullish strategies.

Suppose you also believe that the options are cheap from the perspective of implied volatility. Maybe you are *very* bullish, expecting the price to move higher very quickly. You, therefore, should only focus on very bullish strategies where you are a net buyer of calls. This suggests that you should likely buy a call that is out-of-the-money.

Now suppose that all the same conditions apply, but that you are bearish on implied volatility. This means that you should construct a position that is neutral or bearish on volatility. You might want to consider selling a put or buying a bull spread.

The point is that your outlook on a given stock, its future price behavior, and the future behavior of the greeks will all have an impact on your construction of a strategy.

There are six building blocks that we can use. We can be long or short a call, a put, or the underlying instrument. We can construct any strategy with combinations of those six positions.

THE KEY IS HAVING AN APPROACH

There are an infinite number of possible combinations and permutations of those six positions. It would therefore take forever to come up with One True Path to finding the ultimate strategy.

The most important first decision is your attitude about the future price of the underlying instrument. You can be bullish, bearish, neutral, or don't

FIGURE 6.1 IBM Price Chart

care. I've included "don't care" for those who are doing strategies that are almost arbitrage-type strategies. I recommend starting with this decision because it is usually the key decision for selecting a strategy. The exception would be traders that are consistently trading the arbitrage-type strategies.

Here is an example of what we are talking about.

Let's say that you are bullish on IBM. Having an attitude on the direction of the underlying instrument is the usual starting point for most investors. But then we have to start asking more questions so that we can start to put together the building blocks. How bullish are you? Let's say you are moderately bullish. The current situation can be seen in Figure 6.1.

The price is currently $115.55 per share. We'd like to buy 100 shares or the equivalent. So we take a look at the current implied volatility situation to see if we are bullish or bearish on the implied volatility and therefore on the options. Figure 6.2 shows the current situation with implied and historical volatility for IBM. I think that this situation would suggest that we should be on the short side of options.

We now have decided on the two most important factors affecting options prices. We want to be long the stock and short volatility. We can now start to construct a strategy.

It is wise to consider that you can end up with a portfolio of options but that portfolio will much more closely resemble what you are trying to achieve. Also note that your portfolio will likely be dynamic. You may be buying and selling different options to constantly fine tune your net position in the market. It is also wise to note that a lot of constructing a strategy is trial and error. Does this or that work? You may find that you are sometimes going down a wrong path and have to start over (see Figure 6.3).

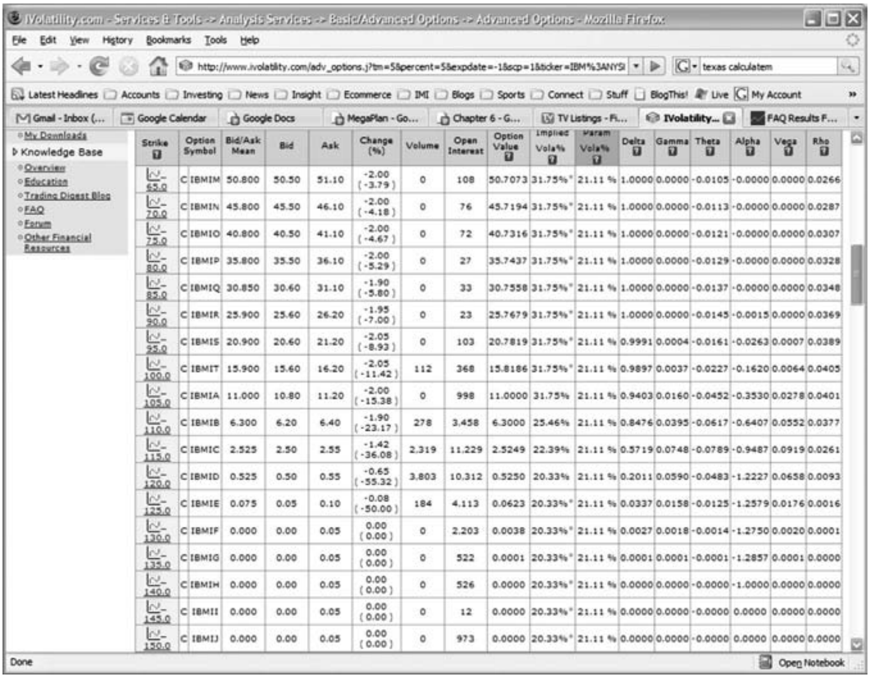
FIGURE 6.2 IBM HV-IV

The most obvious first strategy to look at would be a covered call write. Let's start with the idea of buying 100 shares and selling one contract of the Oct 115 calls. We would be receiving a premium of $2.50 and our greeks would be:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	2.50	22.39	.57	.0748	−.0789	.0919

Let's now combine that with the underlying instrument to see what our net position is:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−2.50	22.39	−.57	−.0748	.0789	−.0919
IBM	115.55		1.00			
Net Position	$9,055		.43	−.0748	.0789	−.0919



Strike	Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Param Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
65.0	C IBMIM	50.800	50.50	51.10	-2.00 (-3.79)	0	108	50.7073	31.75%*	21.11 %	1.0000	0.0000	-0.0105	-0.0000	0.0000	0.0266
70.0	C IBMIN	45.800	45.50	46.10	-2.00 (-4.18)	0	76	45.7194	31.75%*	21.11 %	1.0000	0.0000	-0.0113	-0.0000	0.0000	0.0287
75.0	C IBMIO	40.800	40.50	41.10	-2.00 (-4.67)	0	72	40.7316	31.75%*	21.11 %	1.0000	0.0000	-0.0121	-0.0000	0.0000	0.0307
80.0	C IBMIP	35.800	35.50	36.10	-2.00 (-5.29)	0	27	35.7437	31.75%*	21.11 %	1.0000	0.0000	-0.0129	-0.0000	0.0000	0.0328
85.0	C IBMIQ	30.850	30.60	31.10	-1.90 (-5.80)	0	33	30.7558	31.75%*	21.11 %	1.0000	0.0000	-0.0137	-0.0000	0.0000	0.0348
90.0	C IBMIR	25.900	25.60	26.20	-1.95 (-7.00)	0	23	25.7679	31.75%*	21.11 %	1.0000	0.0000	-0.0145	-0.0015	0.0000	0.0369
95.0	C IBMIS	20.900	20.60	21.20	-2.05 (-8.93)	0	103	20.7819	31.75%*	21.11 %	0.9991	0.0004	-0.0161	-0.0263	0.0007	0.0389
100.0	C IBMIT	15.900	15.60	16.20	-2.05 (-11.42)	112	368	15.8186	31.75%*	21.11 %	0.9897	0.0037	-0.0227	-0.1620	0.0064	0.0405
105.0	C IBMIA	11.000	10.80	11.20	-2.00 (-15.38)	0	998	11.0000	31.75%	21.11 %	0.9403	0.0160	-0.0452	-0.3530	0.0278	0.0401
110.0	C IBMIB	6.300	6.20	6.40	-1.90 (-23.17)	278	3,458	6.3000	25.46%	21.11 %	0.8476	0.0395	-0.0617	-0.6407	0.0552	0.0377
115.0	C IBMIC	2.525	2.50	2.55	-1.42 (-36.08)	2,319	11,229	2.5249	22.39%	21.11 %	0.5719	0.0748	-0.0789	-0.9487	0.0919	0.0261
120.0	C IBMID	0.525	0.50	0.55	-0.65 (-55.32)	3,803	10,312	0.5250	20.33%	21.11 %	0.2011	0.0590	-0.0483	-1.2227	0.0658	0.0093
125.0	C IBMIE	0.075	0.05	0.10	-0.08 (-50.00)	184	4,113	0.0623	20.33%*	21.11 %	0.0337	0.0158	-0.0125	-1.2579	0.0176	0.0016
130.0	C IBMIF	0.000	0.00	0.05	0.00 (0.00)	0	2,203	0.0038	20.33%*	21.11 %	0.0027	0.0018	-0.0014	-1.2750	0.0020	0.0001
135.0	C IBMIG	0.000	0.00	0.05	0.00 (0.00)	0	522	0.0001	20.33%*	21.11 %	0.0001	0.0001	-0.0001	-1.2857	0.0001	0.0000
140.0	C IBMIH	0.000	0.00	0.05	0.00 (0.00)	0	526	0.0000	20.33%*	21.11 %	0.0000	0.0000	-0.0000	-1.0000	0.0000	0.0000
145.0	C IBMII	0.000	0.00	0.05	0.00 (0.00)	0	12	0.0000	20.33%*	21.11 %	0.0000	0.0000	-0.0000	0.0000	0.0000	0.0000
150.0	C IBMIJ	0.000	0.00	0.05	0.00 (0.00)	0	973	0.0000	20.33%*	21.11 %	0.0000	0.0000	-0.0000	0.0000	0.0000	0.0000

FIGURE 6.3 October Calls

We would pay $11,555 for the 100 shares and receive $2,500 for our short call for a net investment of $9,055. However, the position is not acceptable. We wanted to own the equivalent of 100 shares but we are only long 43 shares using this strategy. On the other hand, we like the theta and the vega. We always like the time decay working in our favor. And we have decided that we want to be short options because we think that the implied volatility is going to drop.

The simple solution is to simply buy an additional 57 shares of the underlying IBM shares. This would give us a net position of:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−2.50	22.39	−.57	−.0748	.0789	−.0919
IBM	18,141		1.57			
Net Position	15,641		1.00	−.0748	.0789	−.0919

Now we have exactly what we were looking for, a position that is long the stock in the correct amount but also short implied volatility and will receive positive time decay every day! However, we had to come up with an additional $6,586 to accomplish it.

Let's take another look at this same situation but let's only focus on using options to see what we come up with. Still, we want to be long about 100 shares of the stock and be short implied volatility.

This time, let's try going long an in-the-money option instead of being long the stock. Let's start with buying the 105 call.

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−2.50	22.39	−.57	−.0748	.0789	−.0919
Oct 105 C	11.20	31.75	.94	.016	−.0452	.0279
Net Position	8,700		.37	−.0588	.0337	−.0640

In this case, we are having to come up with $8,700 to initiate the position. We are not making as much on time decay but still have good exposure to a decline in implied volatility. However, we are only long the equivalent of 37 shares. One alternative would be to simply triple the position which would put us long slightly more than 100 shares. We would then have to come up with $26,100 for the whole position but would have a large position in both time decay and implied volatility. Let's try another approach.

We can try selling the 120 C instead of the 115 C.

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 120 C	−.50	20.33	−.20	−.059	.0483	−.0658
Oct 105 C	11.20	31.75	.94	.016	−.0452	.0279
Net Position	10,700		.74	−.043	.0031	−.0379

Interesting. We had to come up with an additional $2 per share but we doubled our delta, basically eliminated time decay as a factor, but cut our exposure to vega by a third.

Let's take a look at the last three tables. The first choice, the covered call write is the most bullish and receives the most time decay and can capitalize the most on a decline in implied volatility. But we have to come up with the most amount of money.

The second choice requires the least amount of money, about half of the first strategy. However, we receive half as much time decay which is fair given that we are investing half as much money. But notice that we are still receiving about $^2/_3$ of the vega compared to the first strategy. We have gained a little efficiency here. We are getting a little more bang for our buck. In addition, it is quite possible that we have to go for the least expensive option because we don't have a lot of money or we need to use what money we have to diversify into other positions.

The final strategy allows us to cut our investment by about $^1/_3$ but we get about $^3/_4$ of the price action so we are getting more price action for our investment. However, we are getting virtually no time decay so we are actually getting less bang for our buck in this category. In addition, we are investing $^1/_3$ less but getting roughly $^2/_3$ less vega for our money. In sum, we are getting extra power on price action but significantly less action on time decay and vega.

Which strategy should we select? I usually look for the strategy that gives me the most bang for the buck, in this case the second strategy. It's not an easy decision because they are all fairly close. You will need to look at other factors to decide, particularly how much capital you have.

NOW WHAT DO I DO?

Time has ticked by for about a month. Let's see where we are now (see Figure 6.4).

Prices have moved down, then up, then down and we are pretty close to where we started. Prices didn't really follow our plan of higher prices. Neither did the implied volatility. Figure 6.5 shows that implied volatility stayed very high even though historical volatility collapsed.

But we are still bullish on the stock and even more bearish on implied volatility. Let's now see how our three strategies are doing and try to figure out what to do with each of them.

FIGURE 6.4 IBM Price Chart

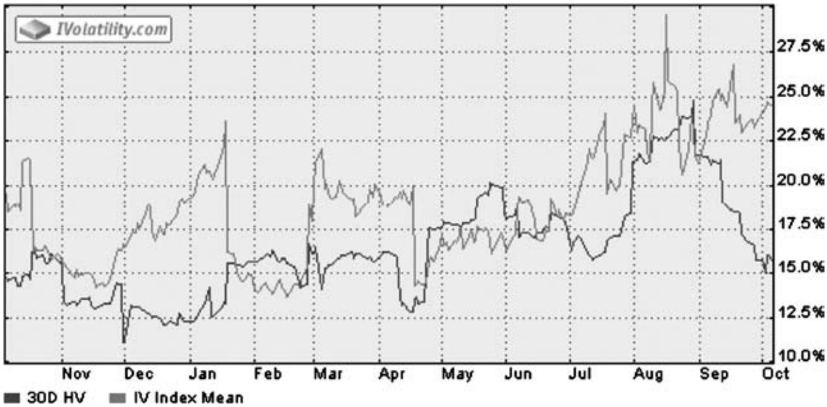


FIGURE 6.5 IBM HV-IV

Strategy number one is now looking like this:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−3.50	27.33	−.61	−.0597	.0922	−.0907
IBM	18,141		1.57			
Net Position and Profit/Loss	+18.10		.96	−.0597	.0922	−.0907

Basically, nothing has happened. We've made $18 (big deal!), the gamma dropped, time decay has increased, and vega is roughly the same.

What about the strategy that gave us more bang for the buck:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−3.50	27.33	−.61	−.0597	.0922	−.0907
Oct 105 C	11.40	31.67	.98	.006	−.021	.0081
Net Position	−$80		.37	−.0591	.0901	−.0826

We've lost a grand total of $80, our delta is the same, the gamma is essentially the same, theta has almost tripled, and vega has increased. This position is even more set up for our scenario but has lost a little money.

Finally, here is the third scenario:

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 120 C	−1.20	26.24	−30	−.056	.0766	−.0821
Oct 105 C	11.40	31.67	.98	.006	−.0210	.0081
Net Position	−$70		.68	−.050	.0566	−.064

We also have a little loss here, our delta is a little lower, gamma is a little higher, theta is higher, and vega has basically doubled.

What do we do now? We are still bullish on the stock and bearish on the implied volatility. The first thing to do is to read the rest of the chapters in this book. They will guide you through the correct thinking to make the right moves. Now we will go through a few exercises that will help you see this book in action.

Let's start with a look at the next expiration (see Figure 6.6).

Now let's repeat where we stand with strategy number one.

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−3.50	27.33	−.61	−.0597	.0922	−.0907
IBM	18,141		1.57			
Net Position and Profit/Loss	+18.10		.96	−.0597	.0922	−.0907

The Oct 115 C is just barely in-the-money. We should expect that 100 of our 157 shares will be called away when it expires. We expect that because it is in-the-money and because we are bullish. There is about $2.00 in time premium left in the short option and we should collect that even if the price of the stock is unchanged. We are in a good position with our positions in theta and vega. But let's take a look at some alternatives.

What would happen if we closed out the Oct 115 C and sold short the Nov 115 C? We'd sell the Nov at $4.50 and pick up an additional $1.00 of time premium which gives us additional $1.00 of potential profit. The gamma is about the same, time decay is must less, and vega is slightly lower. The main advantage of this would be to give us more time to

Expiry: Nov07 Days: 43 Nov07 Vola Chart

Forward	a	b	c
116.61	4.53%	-1.52%	0.65%

Download as .CSV file.

Strike	Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Param Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
75.0	C IBMKO	41.600	41.30	41.90	0.70 (1.71)	0	0	41.6614	27.90%*	43.3 %	1.0000	0.0000	-0.0106	-0.0000	0.0000	0.0698
80.0	C IBMKP	36.600	36.30	36.90	0.65 (1.81)	0	0	36.6855	27.90%*	39.85 %	1.0000	0.0000	-0.0113	-0.0004	0.0000	0.0745
85.0	C IBMKQ	31.700	31.40	32.00	0.75 (2.42)	0	0	31.7101	27.90%*	36.72 %	1.0000	0.0001	-0.0121	-0.0060	0.0004	0.0791
90.0	C IBMKR	26.650	26.40	26.90	0.60 (2.30)	0	1	26.7398	27.90%*	33.88 %	1.0000	0.0006	-0.0136	-0.0434	0.0029	0.0837
95.0	C IBMKS	21.800	21.50	22.10	0.65 (3.07)	0	20	21.8000	27.90%	31.33 %	0.9922	0.0028	-0.0173	-0.1618	0.0125	0.0878
100.0	C IBMKT	16.900	16.70	17.10	0.55 (3.36)	0	11	16.9000	25.51%	29.06 %	0.9730	0.0071	-0.0222	-0.3204	0.0289	0.0911
105.0	C IBMKA	12.250	12.10	12.40	0.50 (4.26)	69	33	12.2500	25.15%	27.07 %	0.9083	0.0176	-0.0337	-0.5219	0.0681	0.0907
110.0	C IBMKB	8.100	8.00	8.20	0.45 (5.88)	31	209	8.1000	24.74%	25.37 %	0.7807	0.0313	-0.0470	-0.6664	0.1189	0.0833
115.0	C IBMKC	4.600	4.50	4.70	0.30 (6.98)	430	1,040	4.6000	23.27%	23.95 %	0.5962	0.0432	-0.0522	-0.8268	0.1549	0.0677
120.0	C IBMKD	2.200	2.15	2.25	0.23 (11.39)	2,455	2,690	2.2000	22.37%	22.83 %	0.3756	0.0436	-0.0460	-0.9474	0.1508	0.0449
125.0	C IBMKE	0.850	0.80	0.90	0.12 (17.24)	1,440	1,337	0.8500	21.66%	21.99 %	0.1870	0.0316	-0.0303	-1.0447	0.1100	0.0236
130.0	C IBMKF	0.250	0.20	0.30	0.05 (25.00)	0	1,757	0.2500	20.93%	21.44 %	0.0698	0.0161	-0.0141	-1.1426	0.0533	0.0092
135.0	C IBMKG	0.075	0.05	0.10	0.08 (0.00)	0	1,009	0.0685	20.93%*	21.16 %	0.0226	0.0065	-0.0056	-1.1600	0.0214	0.0030
140.0	C IBMKH	0.000	0.00	0.05	0.00 (0.00)	0	20	0.0159	20.93%*	21.14 %	0.0061	0.0021	-0.0018	-1.1725	0.0068	0.0008
145.0	C IBMKI	0.000	0.00	0.05	0.00 (0.00)	0	0	0.0032	20.93%*	21.34 %	0.0014	0.0005	-0.0005	-1.1828	0.0018	0.0002
150.0	C IBMKJ	0.000	0.00	0.05	0.00 (0.00)	0	0	0.0005	20.93%*	21.74 %	0.0003	0.0001	-0.0001	-1.1939	0.0004	0.0000

FIGURE 6.6 November Calls

collect on the gains we expect. The Nov's still have 43 days to expiration so we have an additional 30 days for our expected scenario to make money for us.

What about buying back the Oct 115 C and sold short the Nov 120 C? Our maximum profit goes up by $5.00 per share because we have sold short an option with a strike price $5.00 higher. We are only going to receive $2.15 in premium from our short position but it gives us that $5.00 in higher profit potential. So a key part of our decision is when we think the stock price will rally and how strongly. For example, we might as well keep the Oct if we think that the price will limp along over the coming 43 days. It has more time premium and higher theta to create higher profits over the near term.

However, if we believe that the price will rally sharply over the near term, then we should definitely eliminate the short Oct call and write the Nov. That will give us higher profits.

What if we were to look at the Nov 120 C and sell that? The big difference is that the delta is only .37. That is .24 less than the Oct 115 C that we currently have on. That means that we can sell some of our long IBM shares for a profit. The net delta would go from the current .96 up to 1.20 if we did this swap. So we could take some profits on 20 shares of IBM stock and move our net delta down to 1.00.

Let's go through the same procedure with the second strategy.

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Oct 115 C	−3.50	27.33	−.61	−.0597	.0922	−.0907
Oct 105 C	11.40	31.67	.98	.006	−.021	.0081
Net Position	−$80		.37	−.0591	.0901	−.0826

The 105 C is so far in-the-money that we can consider it as similar to being long the underlying stock. So we can simply use the analysis above to consider what to do with the 115 C. The difference is that it will expire in a short time. If it would, then both positions would expire in-the-money and be exercised, thus giving us a nice profit.

However, let's consider changing this spread into a calendar spread. Figure 6.7 shows the January expirations.

What if we were to cover the short Oct 115 C and sell a Jan 120 C?

Option	Premium	Imp Vol	Delta	Gamma	Theta	Vega
Jan 120 C	−4.30	21.73	.46	−.0294	.0325	−.2509
Oct 105 C	11.40	31.67	.98	.0060	−.0210	.0081
Net Position	$8,010		.52	−.0234	.0115	−.2428

Expiry: Jan08 Days: 106 Jan08 Vola Chart

Forward	a	b	c
117.68	8.11%	-3.29%	1.49%

Download as .CSV file.

Strike	Option Symbol	Bid/Ask Mean	Bid	Ask	Change (%)	Volume	Open Interest	Option Value	Implied Vola%	Param Vola%	Delta	Gamma	Theta	Alpha	Vega	Rho
55.0	C IBMAK	61.550	61.30	61.80	0.65 (1.07)	0	1,295	61.7354	36.47%*	54.69 %	1.0000	0.0000	-0.0078	-0.0009	0.0001	0.1573
60.0	C IBMAL	56.650	56.40	56.90	0.65 (1.16)	0	1,020	56.8122	36.47%*	50.43 %	0.9998	0.0000	-0.0086	-0.0041	0.0005	0.1715
65.0	C IBMAM	51.700	51.50	51.90	0.65 (1.27)	0	1,810	51.8926	36.47%*	46.58 %	0.9991	0.0001	-0.0095	-0.0142	0.0019	0.1856
70.0	C IBMAN	46.800	46.60	47.00	0.55 (1.19)	0	1,545	46.9847	36.47%*	43.07 %	0.9969	0.0004	-0.0109	-0.0376	0.0058	0.1991
75.0	C IBMAO	41.950	41.80	42.10	0.60 (1.45)	0	2,282	42.1060	36.47%*	39.88 %	0.9916	0.0010	-0.0129	-0.0777	0.0143	0.2115
80.0	C IBMAP	37.100	36.90	37.30	0.65 (1.78)	0	5,420	37.2888	36.47%*	36.97 %	0.9804	0.0021	-0.0161	-0.1297	0.0297	0.2217
85.0	C IBMAQ	32.300	32.10	32.50	0.60 (1.89)	0	9,695	32.3000	29.24%	34.31 %	0.9840	0.0022	-0.0152	-0.1442	0.0251	0.2374
90.0	C IBMAR	27.550	27.30	27.80	0.70 (2.61)	34	10,667	27.5500	29.14%	31.9 %	0.9630	0.0044	-0.0190	-0.2333	0.0505	0.2441
95.0	C IBMAS	22.800	22.60	23.00	0.55 (2.47)	20	17,552	22.8000	26.82%	29.73 %	0.9399	0.0071	-0.0218	-0.3262	0.0745	0.2501
100.0	C IBMAT	18.350	18.20	18.50	0.50 (2.80)	39	12,252	18.3500	26.22%	27.78 %	0.8895	0.0116	-0.0268	-0.4309	0.1190	0.2460
105.0	C IBMAA	14.150	14.00	14.30	0.50 (3.66)	9	10,141	14.1500	25.15%	26.05 %	0.8184	0.0169	-0.0313	-0.5395	0.1648	0.2346
110.0	C IBMAB	10.300	10.20	10.40	0.40 (4.04)	674	12,530	10.3000	23.83%	24.55 %	0.7224	0.0226	-0.0342	-0.6613	0.2111	0.2138
115.0	C IBMAC	7.000	6.90	7.10	0.30 (4.48)	104	13,327	7.0000	22.64%	23.26 %	0.5985	0.0275	-0.0349	-0.7875	0.2422	0.1821
120.0	C IBMAD	4.400	4.30	4.50	0.25 (6.02)	447	17,772	4.4000	21.73%	22.19 %	0.4566	0.0294	-0.0325	-0.9036	0.2509	0.1421
125.0	C IBMAE	2.525	2.45	2.60	0.18 (7.45)	96	2,965	2.5249	20.93%	21.34 %	0.3157	0.0273	-0.0269	-1.0143	0.2245	0.1002
130.0	C IBMAF	1.325	1.30	1.35	0.10 (8.16)	29	7,249	1.3250	20.36%	20.7 %	0.1965	0.0218	-0.0197	-1.1056	0.1762	0.0633
135.0	C IBMAG	0.650	0.60	0.70	0.05 (8.33)	3	1,747	0.6500	20.05%	20.26 %	0.1120	0.0152	-0.0130	-1.1671	0.1190	0.0358
140.0	C IBMAH	0.300	0.25	0.35	0.03 (9.09)	30	1,406	0.3000	19.89%	20.02 %	0.0586	0.0094	-0.0078	-1.2089	0.0731	0.0189

FIGURE 6.7 January Expirations

Notice that we now have taken some money off the table because we are receiving more premium for the short position. Our delta is now almost 50 percent higher, our gamma gets sharply reduced, our theta is reduced to a negligible amount, but our vega is tripled. In other words, we are now getting far more of what we want for actually a lower investment. We are more long than we were before and have far more ability to make money from a decline in implied volatility. The only give up is that we won't be earning much time decay.

The idea would be to hold this position until expiration when you go through the process again. At that time, you may exercise the Oct C and turn this position from a bull calendar spread to a covered call write. Or perhaps roll the Oct C into a Nov or even Jan.

USING THE TABLES

Remember when we said that you will need to look at such factors as market opinion, volatility, and time decay. You will then be able to make a statement like, "I think that Widgets will move slightly higher in price, volatility will decline, and time premium will decay rapidly because we are approaching expiration." Now you can look through the tables to find the strategy that best fits your outlook. In this case, a covered call write position probably fits the bill.

Here's how to use the table for Strategy Selection (see Figure 6.8). You need to first make a decision on your opinion of future prices. Do you think

Strategy Selection

You are looking for:

Future Prices	Implied Volatility	Strategy	Time Decay
Higher	Higher	Buy Call	Hurts
Higher	Higher	Bull Spread	Hurts
Higher	Higher	Buy Instrument/Buy Put	Hurts
Higher	Lower	Sell Put	Helps
Higher	Lower	Covered Call	Helps
Higher	Neutral	Conversion	Neutral
Lower	Higher	Buy Put	Hurts
Lower	Higher	Bear Spread	Hurts
Lower	Higher	Sell Instrument/Buy Call	Hurts
Lower	Lower	Sell Call	Helps
Lower	Lower	Covered Put Write	Helps
Lower	Neutral	Reverse Conversion	Neutral
Stable	Lower	Sell Straddle	Helps
Stable	Lower	Sell Strangle	Helps
Stable	Lower	Ratio Write	Helps
Stable	Higher	Sell Butterfly	Neutral
Stable	Neutral	Ratio Spread	Helps
Volatile	Higher	Buy Straddle	Hurts
Volatile	Lower	Buy Butterfly	Neutral

FIGURE 6.8 Strategy Selection

that they will be higher, lower, stable, or volatile in the future? You then look at the table to find those strategies that fit that outlook. As you can see, the first six strategies are for when you are looking for higher prices in the future.

You then look at the second column. Here, the first three strategies are supported by higher implied volatility. So assume that you are bullish on the stock but bearish on implied volatility. The chart then tells you that you have two possible strategies to focus on: sell a put or do a covered call write. These are the two strategies that will profit the most by a bullish price scenario but a bearish outlook on implied volatility. You can then look at the final column to see if time decay will help you or hurt you.

This table provides all you need to make the initial cut at what strategy you should use. In this case, you have narrowed the choice down to two strategies. Now you should go to those two chapters in the book to make the final decision.

TABLE 6.1 List of Strategies

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Buy a call	Bullish	Increasing helps	Hurts	Helps	Unlimited	Limited
Buy a put	Bearish	Increasing helps	Hurts	Helps	Limited	Limited
Naked call writing	Bearish	Decreasing helps	Helps	Hurts	Limited	Unlimited
Covered call writing	Bullish	Decreasing helps	Helps	Hurts	Limited	Limited
Ratio covered call writing	NA	NA	Helps	Helps	Limited	Unlimited
Naked put writing	Bullish	Decreasing helps	Helps	Hurts	Limited	Unlimited
Covered put 2riting	Bearish	Decreasing helps	Helps	Hurts	Limited	Unlimited
Ratio covered put writing	NA	NA	Helps	Hurts	Limited	Unlimited
Bull spreads	Bullish	Increasing helps	Hurts	Helps	Limited	Limited
Bear spreads	Bearish	Increasing helps	Hurts	Helps	Limited	Limited
Butterfly spreads	Usually neutral					
Calendar spreads	Either	Either	Either	Either	Either	Either
Ratio spreads	Either	Either	Either	Either	Either	Either
Long straddles	Either way a lot	Increasing helps	Hurts	Helps	Unlimited	Limited
Short straddles	Stay stable	Decreasing helps	Helpts	Hurts	Limited	Unlimited
Long strangles	Either way a lot	Increasing helps	Hurts	Helps	Unlimited	Limited
Short strangles	Stay stable	Decreasing helps	Helpts	Hurts	Limited	Unlimited

THE BOTTOM LINE

You now have two methods for figuring out what strategy you should use in different situations. The initial method will allow you to sculpt the returns and risk in a very fine way. But it takes more time. You will need to test and retest before you find a strategy that fits your outlook.

Table 6.1 is much easier because it is looking at strategy selection from 35,000 feet. You only have to make a couple of decisions and you will be staring at only two or three possible strategies.

Let me suggest that you combine the two methods. Use the table to narrow down the possible strategies and then use the first method to fine tune what the table is giving you.

Options are incredibly flexible. It is hard to narrow down what strategy to use. Most people just use one or two strategies and never deviate from those. However, I recommend keeping an open mind and working harder to gain higher rewards and lower risk by looking at all the options open to you (see Table 6.1).

CHAPTER 7

Buy a Call

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Buy a Call	Bullish	Increasing Helps	Hurts	Helps	Unlimited	Limited

STRATEGY

Buying a call is a bullish strategy that requires a price rise in the underlying instrument (UI). The most critical factor in trading calls profitably is an ability to predict the future price moves of the UI. The rest of the discussion on buying a call is secondary to the problem of market timing.

The option chart in Figure 7.1 shows the return from buying a call. There is, theoretically, unlimited profit but limited risk.

EQUIVALENT STRATEGY

The major difference between the long call strategy and the *long instrument/long put strategy* is the commission. It costs significantly less to simply buy a call.

Many investors will buy a put to protect a profit or to provide a stop-loss point when they initiate a long instrument position. The net result is

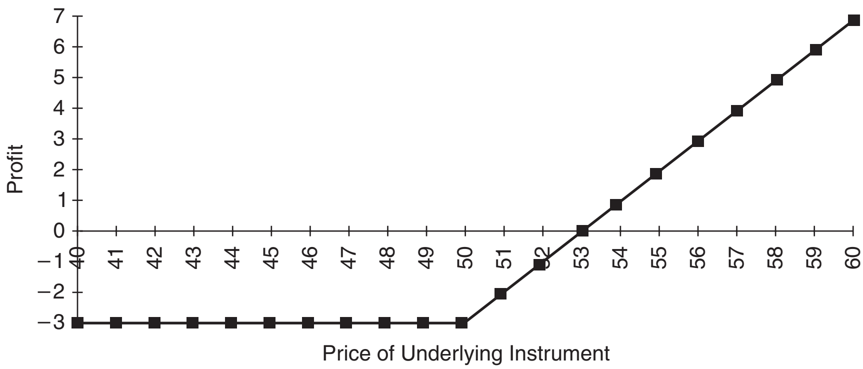


FIGURE 7.1 Buy a Call

that they have duplicated a long call. In other words, they leg into the long instrument/long put position rather than consciously put it on from the very beginning.

RISK/REWARD

Maximum Return

The maximum profit potential is theoretically unlimited. The profits climb as the price of the UI climbs—a purchase of a call will gain one point for every point the underlying index gains if it is in-the-money at expiration. Before expiration, the call will move as the UI moves multiplied by the delta. For example, assume a long OEX position at 549 and an April 550 call option with a premium of $4. Each point move of the OEX above the strike price of 550 will cause a move of at least one point in the call premium at expiration. Thus, the call premium on expiration would be 9,450 if the OEX were at 10,000. Although the call profits are theoretically unlimited, as a practical matter, the profits will be proportional with the gains in the UI.

Break-Even Point

The break-even point, at expiration, is the strike price plus the call premium. The formula for the simple break-even point for calls is:

$$\text{Simple break-even point} = \text{Strike price} + \text{call premium}$$

The price of the UI must climb by some amount before expiration for you to make any money at expiration. For example, assume you bought OEX 580 options at 12 and the OEX was at 575. If the option expires and the OEX is at 582, you will lose 10 points. The option gives you the right to buy the OEX at 580, which means the option has 2 points of intrinsic value with the OEX at 582. At expiration, the option has no time value. You, therefore, bought the option at 12, and, at expiration, it was worth 2. The OEX needed to rise to 592 before you would have profited.

You can lose money before the expiration of the contract if the price of the UI declines. For example, suppose the UI went from 550 to 545 the first day after you bought a call. The value of the call will have dropped below its initial price. The amount of the drop is estimated by the delta of the call (see Chapter 3 and Chapter 4 for more details). The delta is largely dependent on whether the option is in- or out-of-the-money. An out-of-the-money call will usually not fall as much as an in-the-money call. This is because the value of an out-of-the-money call is time value rather than intrinsic value. The decline will be greater if the option is in-the-money because it will have more intrinsic value.

The actual break-even point is the same as the simple point, but it includes transaction costs and carrying costs. Thus, the formula is:

$$\begin{aligned}\text{Actual break-even point} = {} & \text{Simple break-even point} \\ & -\text{transaction costs} + \text{carrying costs}\end{aligned}$$

The break-even point is affected by the type of account and transaction. The trade can take place using cash or on margin. Transaction costs for margin trades will be more than for cash trades because interest payments must be made. The carrying cost for a cash transaction will only be the opportunity cost and the interest income if you are posting Treasury bills for margin or if the brokerage house pays you interest on balances. Carrying costs for trades on margin include the financing for the additional quantity of the UI.

The Maximum Risk

The maximum risk is the premium paid for the option. For example, your risk on the purchase of an Exxon call at $4^3/_8$ is \$437.50. You cannot lose more than the initial premium cost plus transaction costs and carrying costs.

Net Investment Required

Purchasing calls is always a debit transaction; you must pay the premium. One example is that you must pay \$1,500 to buy a call on Treasury-bond futures if the price is $1^1/_2$. Another example is that you will pay \$750 for 10 stock options with a premium of 0.75 each.

The Investment Return

The investment return on a call is the profit or loss divided by the initial investment. The formula is:

$$\text{Return} = (\text{Profit or loss}) \div \text{initial investment}$$

For example, if you buy an IBM option for 5 and sell it for $7^1/_2$, for a profit of $2^1/_2$, your return on investment is 50 percent ($2^1/_2 \div 5 = 0.50$, or 50 percent). Annualizing the return will give you another perspective on the return. If this particular trade covered three months from beginning to end, you would have made a 200 percent annualized return.

However, in most cases, the return on investment is not the major criterion in buying a call. The main reason for buying a call is leverage. You can gain large percentage gains with a small investment. The low price of calls makes discussions of rates of return almost meaningless when examined on a trade-by-trade basis. Many of your trades might make 200 percent, but your losses might be 100 percent. These are large percentages simply because the initial investment is so low.

ORDERS

You can use just about any type of order for entering and exiting long calls. However, it is recommended that you use some type of limit order when trading options with little liquidity (see Chapter 2 for more information on the types of orders).

DECISION STRUCTURE

Selecting a Call

Selecting which call to buy requires an examination of:

- Expiration date
- Strike price
- Price

Expiration Date The selection of the expiration date is largely dependent on when you expect the price of the UI to rally and what you expect the movement of implied volatility to be. Buy the nearby expiration if you believe that the up-move in price is imminent. It will respond the most to the up-move (because it has the highest gamma) and provide the greatest leverage because it will have a higher delta than farther expirations. In addition, its time value will be less than that of farther expiration months and, therefore, will be less expensive, while providing greater profits (although the time decay will be larger per day).

Consider buying the farther expiration months if you are unsure when the market will make its move or if you think the market may be steady but you want to make sure you do not miss the move. The relative prices are also important. You might want to pay a higher price for a farther month just to have more time for the trade to work. The extra time premium might be a cheap price to pay for several more months for the trade to work. The total time decay will be larger for the longer expiration date, but the cost per day will be much less. Remember, you can always liquidate the position before the time decay starts to accelerate, thus reducing significantly the cost of time decay. However, most traders do not hold positions very long, and the extra price might be a waste of time.

You should buy the nearby expiration if you believe that implied volatility will be declining. Short-term options have lower vegas and are less sensitive to changes in implied volatility. Therefore, you will not be hurt as badly if the implied volatility does decline. Conversely, you will want to buy a far-dated option if you believe that implied volatility will be increasing. The vega of far options is much greater than near options, and you will be able to profit handsomely if the implied volatility moves significantly higher.

The final consideration is liquidity. Far-dated options may not have good liquidity and may have to be avoided. This is a lesser problem if you intend to hold the position to expiration and will not have to exit early.

In sum, the critical considerations for the selection of the expiration date of the call are your expectations for implied volatility and the speed of the expected price move.

Strike Price Your market attitude determines which strike price to select. The more bullish you are, the higher the strike you should select. Calls with higher strike prices require a larger up-side move before they are profitable on the last day of trading. Calls with lower strike prices require smaller up-side moves before they are profitable at expiration. Once the high strike call goes into the money, its percentage return skyrockets. The main reason is that the investment is so much lower than for lower strike prices. Nonetheless, the rule is that higher strike calls have a greater percentage return than lower strike calls *if they go sufficiently* *in-the-money.* Lower strike calls will always have higher dollar returns than higher strike calls.

If you are very bullish on the UI, then buy out-of-the-money calls. The highest strike price is the most bullish. This will give you the greatest profit potential on a percentage basis, though there is less chance of success because the market has to rally farther before the call is in-the-money.

If you are less bullish and want a greater chance of success, buy in-the-money calls. The lowest strike price is the least bullish choice. You will be cutting your potential percentage return, but you will have a greater chance of success because the intrinsic value of the in-the-money calls gives you an advantage.

In effect, the out-of-the-money call has fewer dollars to risk but a greater probability of loss. For example, the price of the UI could rise slightly. You could lose money by having an out-of-the-money option, but still make money with an in-the-money option. In addition, the chances of an in-the-money option expiring worthless are less than for an out-of-the-money option.

You will be better off buying a slightly in-the-money or an at-the-money option if you are looking for a quick move, because the higher delta will respond immediately to any price change in the UI. Out-of-the-money options will require a greater move in the UI to get the same dollar gain. The choice then becomes which of the two types will give the greatest percentage return on the investment, given your price expectation. The net effect is that an out-of-the-money call will give you greater returns on large price moves of the UI, but the in-the-money call will provide superior returns if the UI only rises moderately.

Perhaps the best strategy is to first determine how much money you are willing to lose on the trade and how bullish you are, and then determine the best call strike. For example, assume that you are willing to lose $2,000 on this particular trade. Further assume that the at-the-money options are trading for $4 and the out-of-the-money options are trading for $2. This means that you could have twice as many of the out-of-the-money options as you could of the at-the-money options. This is obviously very attractive. However, you then have to consider the probability of a large move. The at-the-money options might be a better deal after you consider the probable price outlook.

The bottom line is that you must have a target price on the upcoming bull move. You can then easily calculate the probable payoff of various quantities of various strike prices and select the appropriate quantity of the appropriate strike price.

Many investors buy out-of-the-money calls because they are less expensive. This is a poor reason to buy a call. If you have so few funds that you cannot afford in-the-money calls, then you are probably speculating needlessly and taking on too much risk.

This discussion is based mainly on the premise that you will only buy one option. However, it might be better to buy two out-of-the-money options for the same price as one at-the-money or in-the-money option.

Price The price you pay for the call is the final consideration for selecting a call. Examining the factors that influence the price will determine if you are getting a good price and will give further clues to how the price of your selected options will behave. The major factor to consider is the expected volatility. Occasionally, you should consider expected changes in interest rates and, in some cases, expected dividend payments. The point of examining the factors that influence prices is to discover options that are undervalued relative to your estimate of the fair value of the option.

Expected Volatility

The expected volatility is the most important factor affecting your estimate of the fair value and has a major impact on the selection of an option. If the volatility is expected to increase, the price of the option will be expected to increase, all other things being equal. You will need to have an option evaluation service or computer program to calculate the effect of an increase or decrease in volatility on the position.

A decrease in volatility will have an adverse effect on your position. You must carefully weigh the effects of a decline in volatility versus your expected price move in the UI. Once again, a computer program or service that details implied volatilities and the effect of changes in implied volatility on the option is extremely important. It is quite possible to get an expected move in the UI but then to lose money on the call because the volatility declined.

A ramification of this is that you should select calls on the basis of the expected volatility versus their current price. For example, assume that two UIs are trading for the same price, but the first one has a volatility three times that of the second one. That means that the options on the first UI will be priced significantly higher than those of the second UI. If the options on the first UI are priced below a level that compensates for the greater volatility, it represents a better deal than the second option.

Systematic Call Selection

Most people view the selection of which call to buy as entirely derived from their projections of the price of the UI. This is certainly a valid procedure. But you can also examine the risk/reward of various calls first without looking at the merits of the UI. One method is to list calls in various rankings. You could, for example, list all calls by their risk/reward characteristics given certain market moves. Note that you could examine all flavors of options, from OEX to soybeans, and apply the same criteria. Or you could focus on just those options in a group that you have selected through other means.

Suppose you think computer-industry stocks will go up in price, but you do not know which stock or option to buy because you do not pick specific stocks. You could rank the options of the computer stocks by criteria that fit your trading style. As a suggestion, consider ranking the options by a risk/reward ratio. First, pick a time horizon. For example, you expect the move to higher prices to occur over the coming three months. Assume that each stock in the industry group will move either up or down by the amount of the implied volatility. Alternately, assume that they will move higher or lower by your expected volatility. Note that you are assuming that the price could move both up and down, even though you are examining these particular stocks because you think they will rally. This is so you can estimate their prices after both rises and falls and so you can estimate the reward from the expected rally and the risk if there is no rally.

Thus, for an excellent guide to the relative risk and reward of holding various options, take the implied or estimated volatility for each stock, estimate the price of the options given a price movement equal to the volatility during the time period, and then divide the resulting bullish option price by the bearish option price.

If the Price of the Underlying Instrument Drops

If the UI price drops, there are four possible strategies. First, if you are now bearish, liquidate the trade. There is never any reason to hold a position that is counter to your current outlook. The other three strategies are for use only if you are still bullish.

1. Hold your current position.
2. Sell your current position and buy a lower strike.
3. Sell a near-term call.

The first strategy is to *hold your current position.* This is often the best choice if there is little premium left and, therefore, little dollar risk in holding the position. However, it is not a good strategy if there is significant time left on the option and the market would have to rally substantially to hit your break-even point. For example, why bother liquidating the position if it is only worth $ $^{1}/_{16}$? It will cost just about as much in transaction costs to liquidate as it will to just let it expire. In effect, your position is now a lottery ticket.

The second choice is *rolling down*: This simply entails liquidating your current call and buying another call at a lower strike price. This increases your chance of making money but at the cost of paying more premium. The criteria for rolling down are essentially the same as establishing a new position. Rolling down is often done because the position has not profited as quickly as expected.

Another strategy is to turn your position into a bull spread. You would do this by selling two of your current calls and buying a call with a lower strike price. Your position will then be long one call with a lower strike price and short one call with your original strike price. In effect, you have rolled out of your long call position into a bull call spread (see Chapter 15 for more details). The criteria for the switch in position is the same as initiating a bull spread. If the new position does not meet the criteria for initiating a bull spread, then the position should not be put on. One rule of thumb is to try to buy the lower strike price for about the same price as the combined prices of the two calls you sold. For example, try to buy the OEX 540 calls at 5 if you can sell the two OEX 550 calls for $^1/_2$ each.

This strategy does not require the sharp rally in the UI to make money. It, therefore, puts you in a better position to gain. The sacrifice is that the profit potential is reduced significantly. The net result is that the break-even point is lowered and the dollar risk stays about the same, but the maximum profit potential is also reduced. Another way to look at it is that the chance of success has been improved, but the return from that success has been reduced.

You might want to consider this strategy also if you now believe that implied volatility will be declining dramatically. A decline in implied volatility will make your current position decline in value even if the price of the UI does not change. You reduce your sensitivity to implied volatility by selling another call. You will still be long vega but not as much.

The third strategy for holders of intermediate- or long-term calls is to *sell a near-term call.* For example, you are holding the *July* OEX 550 calls and the price of the underlying index declines. You could sell an April OEX 550 call, creating a calendar spread (see Chapter 18 for more details). Basically, you are trying to capture the time premium on the near call as a method of lowering the cost of the far call. This strategy is particularly attractive if the near call is about to expire and the time premium is decaying rapidly. Then, if the UI rallies, you will still have the original call but at a lower price.

Investors must be very cautious when using this strategy, however, because they have initiated a bearish position. A sharp rally in the UI while you are holding the short near call will probably create more losses in the near call than profits in the far call because of the much higher gamma.

Thus, you should be very sure that the market will not zoom higher over the near term.

Another consideration of this strategy is that the far contract is much more sensitive to changes in implied volatility. In effect, you have reduced the sensitivity of your long call by a little amount by selling the nearby call.

If the Price of the Underlying Instrument Rises

If you are now bearish and the price of the UI rises, liquidate the trade and take your profits. There is never any reason to hold a position against your current outlook. You have several choices if you are still bullish:

1. Sell a higher strike and hold-your existing call.
2. Sell your existing position and buy a higher strike.
3. Hold your existing call.

The first choice, to *sell a higher strike and hold your existing call*, turns your long call into a bull call spread. This strategy costs nothing except the extra commission, though you may need to post additional margin, depending on the option. You will need a margin account if you are going to do this with stock options. You have essentially locked in your profit, but you have still retained more profit opportunity. This strategy will be best if the market only climbs a little more or is stable. The bull call spread strategy will have the worst performance if the market continues to rally strongly. It is not that you will lose money, but the profits will not be as high as with the two other strategies. The profit potential, though, is reduced to the difference between the strike prices.

For example, you bought an OEX 550 call and the price of the underlying index has rallied. You could sell the OEX 570 call, lock in your profit, and retain the possibility of a further profit of 20 points, the difference between the two strike prices (see Chapter 15 for more details on the ramifications of this strategy).

You may want to consider this strategy if you now believe that implied volatility will be declining dramatically. A decline in implied volatility will make your current position decline in value even if the price of the UI does not change. You reduce your sensitivity to implied volatility by selling another call. You will still be long vega but not as much.

The second and most aggressive approach, called *rolling up*, is to liquidate your current position and buy another call but at a higher strike price. This is the best strategy if you are very bullish. Note, though, that the market must rise to above the new break-even point for you to make money on the new position. Thus, a stable or even slightly higher market will cause this strategy to be the worst of the three. For example, assume you bought an OEX 550 call at 5, it currently trades at 15, and the OEX 570 calls are trading for 3. You could liquidate the OEX 550s, take the 10-point profit, and invest 3 in the OEX 570 calls. Notice that you have taken out the money you initially invested and are now investing only your profits.

The third strategy is to *hold to your existing position.* This is best if you are looking for a moderate move higher, but it is the worst if the market drops below the original break-even point. Note that this is the riskiest of the three strategies because it is the only one that could have a loss on the whole series of transactions. For example, you bought the OEX 550 calls at 5, and they have gone to 15. The other two strategies lock in some of the profit at this point. Holding the existing position will lose money if the price of the OEX drops below the break-even point.

Further changes in the risk/reward situation can be accomplished by changing the number of contracts used in each strategy. For example, you could sell twice as many calls as you have long calls in the bull call strategy. This is obviously a more bearish strategy than writing the same number of calls as you originally bought. The price of the UI could now probably drop, and you would still make a profit. Or how about buying twice as many calls when you roll up? You are now taking a much more bullish stance in the market.

If the Option Is About to Expire

Another consideration is the time left on the position. Time decay accelerates near option expiration, which makes holding options less attractive. Your choices are the same as initiating a new trade. The additional wrinkle is that time decay is a more important consideration near expiration. In general, if you are still bullish, you should roll forward into the next expiration month as a tactic to reduce the impact of the time decay. If you are now bearish, liquidate the trade before all the time premium decays.

Another decision is whether or not to exercise. You will never want to exercise if the option has any time premium. This is because the exercise of the option will cause you to lose the remaining time premium.

In general, it is unwise to exercise if there is a cost to the exercise process. For example, it costs extra commissions to exercise a stock option because commissions must be paid on the purchase of the stock. On the other hand, there is automatic exercise of many futures options where the cost is neglible. In most cases, you are better off buying back the call if the premium is greater than the cost of commissions.

CHAPTER 8

Buy a Put

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Buy a Put	Bearish	Increasing Helps	Hurts	Helps	Limited	Limited

STRATEGY

Buying a put is a bearish strategy that requires a price drop in the underlying instrument (UI). Nonetheless, the most critical factor in trading puts profitably is an ability to predict the future price moves of the UI. The rest of the discussion on buying a put is secondary to the problem of market timing.

The options chart in Figure 8.1 shows the return from buying a put. There is, theoretically, unlimited profit but limited risk.

EQUIVALENT STRATEGY

The major difference between the long put strategy and the *short instrument/long call strategy* is the commission. It is significantly less expensive to simply buy a put.

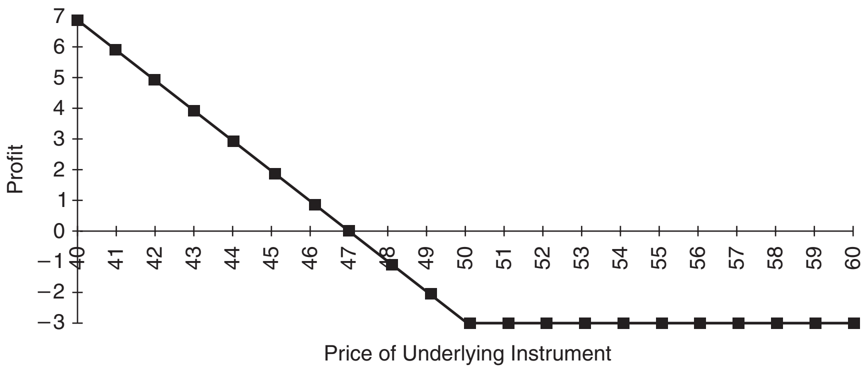


FIGURE 8.1 Buy a Put

However, some investors will buy a call to protect a profit or to provide a stop-loss point when they initiate a short sale of the instrument. The net result is that they have duplicated a long put. In other words, they leg into the short instrument/long call position rather than consciously put it on from the very beginning.

RISK/REWARD

Maximum Return

The maximum profit potential is limited by the fact that the price of the UI cannot go below zero. The profits climb as the price of the UI drops—a purchase of a put will gain one point for every point the underlying index drops if it is in-the-money at expiration. Before expiration, the price change of the put will be approximately equal to the price change of the UI multiplied by the delta. For example, assume the OEX is trading at 151 and the April 150 put option has a premium of $4. Each point move of the OEX below the strike price of 150 will cause a move of one point in the put premium. Thus, the put premium on expiration would be 149 if the OEX were at 1. Although the put profits are theoretically limited, as a practical matter, the profits will be proportional with the price drops of the UI.

Break-Even Point

The break-even point, at expiration, is the strike price minus the put premium. The formula for the simple break-even point for puts is:

$$\text{Simple break-even point} = \text{Strike price} - \text{put premium}$$

The price of the UI must drop by some amount before expiration for you to make any money at expiration. For example, assume you bought OEX 180 options at 12 and the OEX was at 185. If the option expires and the OEX is at 178, you will lose 10 points. The option gives you the right to sell the OEX at 180, which means the option has two points of intrinsic value with the OEX at 178. At expiration, the option has no time value. You, therefore, bought the option at 12, and, at expiration, it was worth 2. The OEX needed to fall to 168 before you would have profited.

You can lose money before the expiration of the contract if the price of the UI climbs. For example, suppose the UI went from 150 to 155 the first day after you bought a put. The value of the put will have dropped below its initial price. The amount of the drop is quantified by the delta of the call (see Chapter 2 and Chapter 4 for details). The delta is largely dependent on whether the option is in- or out-of-the-money. An out-of-the-money put will usually not fall as much as an in-the-money put. This is because the value of an out-of-the-money put is time value rather than intrinsic value. The decline will be greater if the option is in-the-money because it will have more intrinsic value.

The actual break-even point is the same as the simple point, but it includes transaction costs and carrying costs. Thus, the formula is:

$$\text{Actual break-even point} = \text{Simple break-even point} - \text{transaction costs} + \text{carrying costs}$$

The break-even point is affected by the type of account and transaction. The trade can take place using cash or on margin. Transaction costs for margin trades will be more than for cash trades. The carrying cost for a cash transaction will only be the opportunity cost. Carrying costs for trades on margin include the financing for the additional quantity of the UI.

The Maximum Risk

The maximum risk is the premium paid for the option. For example, your risk on the purchase of a Widget call at $6^3/_8$ is \$637.50. You cannot lose more than the initial premium cost plus transaction and carrying costs.

Net Investment Required

Purchasing puts is always a debit transaction; you must pay the premium. For example, you must pay \$1,500 to buy a put on Treasury-bond futures if the price is $1^1/_2$. You will pay \$750 for 10 stock options with a premium of 0.75 each.

The Investment Return

The investment return on a put is the profit or loss divided by the initial investment. The formula is:

$$\text{Return} = (\text{Profit or loss}) \div \text{initial investment}$$

For example, if you buy an IBM put option for 5 and sell it for $7^1/_2$, for a profit of $2^1/_2$, your return on investment is 50 percent ($2^1/_2 \div 5 = 0.50$, or 50 percent). Annualizing the return will give you another perspective on the return. If this particular trade covered three months from beginning to end, you would have made a 200 percent annualized return.

However, in most cases, the return on investment is not the major criterion of buying a put. The main reason for buying a put is leverage. You can gain large percentage gains with a small investment. The low price of puts make discussions of rates of return almost meaningless when examined on a trade-by-trade basis. Many of your trades might make 200 percent, but your losses might be 100 percent. These are large percentages simply because the initial investment is so low.

ORDERS

You can use just about any type of order for entering and exiting long puts. However, it is recommended that you use some type of limit order when trading options with little liquidity (see Chapter 2 for more information on the types of orders).

DECISION STRUCTURE

Selecting a Put

Selecting which put to buy requires an examination of:

- Expiration date
- Strike price
- Price

Expiration Date The selection of the expiration date is largely dependent on when you expect the price of the UI to drop and what you expect the movement of implied volatility to be. Buy the nearby expiration if you believe that a decline in price is imminent. It will respond the most to the down-move (because it has the highest gamma) and provide the greatest leverage because it will have a higher delta than farther expirations. In addition, its time value will be less than that of farther expiration months and, therefore, will be less expensive while providing greater profits. (However, the time decay will be larger per day.)

Consider buying the farther expiration months if you are unsure when the market will make its move or if you think the market may be steady but you want to make sure you do not miss the move. The relative prices are also important. You might want to pay a higher price for a farther month just to have more time for the trade to work. The extra time premium might be a cheap price to pay for several more months for the trade to work. The total time decay will be larger for the longer expiration date, but the cost per day will be much less. Remember, you can always liquidate the position before the time decay starts to accelerate, thus reducing significantly the cost of time decay. However, most traders do not hold positions very long, and the extra price might be a waste of time.

You should buy the nearby expiration if you believe that implied volatility will be declining. Short-term options have lower vegas and are less sensitive to changes in implied volatility. Therefore, you will not be hurt as badly if the implied volatility does decline. Conversely, you will want to buy a far-dated option if you believe that implied volatility will be increasing. The vega of far options is much greater than near options, and you will be able to profit handsomely if the implied volatility moves significantly higher.

The final consideration is liquidity. Far-dated options might not have good liquidity and might have to be avoided. This is a lesser problem if you intend to hold the position to expiration and will not have to exit early.

In sum, the critical considerations for the selection of the expiration date of the call are your expectations for implied volatility and the speed of the expected price move.

Strike Price Your market attitude determines which strike price to select. The more bearish you are, the lower the strike you should select. Puts with lower strike prices require a larger down-side move before they are profitable on the last day of trading. Puts with higher strike prices require smaller down-side moves before they are profitable at expiration. Once the low strike put goes into the money, its percentage return skyrockets. The main reason is that the investment is so much lower than for higher strike prices. Nonetheless, the rule is that lower strike puts have a greater percentage return than higher strike calls *if they go sufficiently in-the-money.* Higher strike puts will always have higher dollar returns than lower strike puts.

If you are very bearish on the UI, then buy out-of-the-money puts. The lowest strike price is the most bearish. This will give you the greatest profit potential on a percentage basis, though there is less chance of success because the market has to drop farther before the put is in-the-money. If you are less bearish and want a greater chance of success, buy in-the-money puts. The highest strike price is the least bearish choice. You will be cutting your potential percentage return, but you will have a greater chance of success because the intrinsic value of the in-the-money puts gives you an advantage.

In effect, the out-of-the-money put has fewer dollars to risk but a greater probability of loss. For example, the price of the UI could drop slightly. You could lose money by having an out-of-the-money option but still make money with an in-the-money option. In addition, the chances of an in-the-money option expiring worthless are less than for an out-of-the-money option.

You will be better off buying a slightly in-the-money option or an at-the-money option if you are looking for a quick move because the higher delta will respond immediately to any price change in the UI. Out-of-the-money options will require a greater move in the UI to get the same dollar gain. The choice then becomes which of the two will give the greatest percentage return on the investment, given your price expectation. An out-of-the-money put will give you greater returns on large price moves of the UI, but the in-the-money put will provide superior returns if the UI only drops moderately.

Perhaps the best strategy is to first determine how much money you are willing to lose on the trade and how bearish you are, and then determine the best strike price. For example, assume that you are willing to lose $2,000 on this particular trade. Further assume that the at-the-money options are trading for $4 and the out-of-the-money options are trading for $2. This means that you could have twice as many of the out-of-the-money options as you could of the at-the-money options. This is obviously very attractive. However, you then have to consider the probability of a large move. The at-the-money options might be a better deal after you consider the probable price outlook.

The bottom line is that you must have a target price on the upcoming bear move. You can then easily calculate the probable payoff of various quantities of various strike prices and select the appropriate quantity of the appropriate strike price.

Many investors buy out-of-the-money puts because they are less expensive. This is a poor reason to buy a put. If you have so few funds that you cannot afford in-the-money puts, then you are probably speculating needlessly and taking on too much risk.

This discussion is based mainly on the premise that you will only buy one option. However, it might be better to buy two out-of-the-money options for the same price as one at-the-money or in-the-money option.

Price The price you pay for the put is the final consideration for selecting a put. Examining the factors that influence the price will determine if you are getting a good price and will give further clues to how the price of your selected options will behave. The major factor to consider is the expected volatility. Occasionally, you should consider expected changes in interest rates and, in some cases, expected dividend payments. The point of examining the factors that influence prices is to discover options that are undervalued relative to your estimate of the fair value of the option.

Expected Volatility

The expected volatility is the most important factor affecting your estimate of the fair value and has a major impact on the selection of an option. If the volatility is expected to increase, the price of the option will be expected to increase, all other things being equal. You will need to have an option evaluation service or computer program calculate the effect of an increase or decrease in volatility on the position.

A decrease in volatility will have an adverse effect on your position. You must carefully weigh the effects of a decline in volatility versus your expected price move in the UI. Once again, a computer program or service that details implied volatilities and the effect of changes in implied volatility on the option is extremely important. It is quite possible to get an expected move in the UI but lose money on the put because the volatility has declined.

A ramification of this is that you should select puts on the basis of the expected volatility versus their current price. For example, assume that two UIs are trading for the same price, but one has a volatility three times that of the other. That means that the options on the first UI will be priced significantly higher than those on the second UI. If the options on the first UI are priced below a level that compensates for the greater volatility, it represents a better deal than the second option.

Systematic Put Selection

Most people view the selection of puts as entirely derived from their projections of the price of the UI. This is certainly valid. But you can also examine the risk/reward of various puts first without looking at the merits of the UI.

One method is to list puts in various rankings. You could, for example, list all puts by their risk/reward characteristics given certain market moves. Note that you could examine all flavors of options, from OEX to soybeans, and apply the same criteria. Or you could focus on just those options in a group that you have selected through other means.

Suppose you think computer-industry stocks will go down in price, but you do not know which stock or option to buy because you do not pick specific stocks. You could rank the options of the computer stocks by criteria that fit your trading style. Consider ranking the options by a risk/reward ratio. First, pick a time horizon. For example, you look for the move to lower prices to occur over the coming three months. Assume that each stock in the industry group will move either up or down by the amount of the implied volatility. Alternately, assume that they will move higher or lower by your expected volatility. Note that you are assuming that the price could move both up and down, even though you are examining these particular stocks because you think they will slump. This is so you can estimate their prices after both rises and falls and so you can estimate the reward from the expected price decline and the risk if there is no decline.

Thus, for an excellent guide to the relative risk and reward of holding various options, take the implied or estimated volatility for each stock, estimate the price of the options given a price movement equal to the volatility during the time period, and then divide the resulting bullish option price by the bearish option price.

If the Price of the Underlying Instrument Rises

If the UI price rises, there are five possible strategies. First, if you are now bullish, liquidate the trade. There is never any reason to hold a position that is counter to your current outlook. The other four strategies are for use only if you are still bearish.

1. Hold your current position.
2. Sell your current position and buy a higher strike.
3. Sell two of your current positions and buy a higher strike.
4. Sell a near-term put.

The first strategy is to *hold your current position.* This is often the best choice if there is little premium left and, therefore, little dollar risk in holding the position. However, it is not a good strategy if there is significant time before expiration and if the market would have to drop substantially to hit your break-even point. For example, why bother liquidating the position if it is only worth $\$^1/_{16}$? It will cost just about as much in transaction costs to liquidate as it will to just let it expire. In effect, your position is now a lottery ticket.

The second choice is *rolling up*: This simply entails liquidating your current put and buying another put at a higher strike price. This increases your chance of making money but at the cost of paying more premium. The criteria for rolling up are essentially the same as establishing a new position. Rolling up is often done because the position has not profited as quickly as expected.

The third strategy is to *turn your position into a bear spread.* This strategy entails selling two of your current puts and buying a put with a higher strike price. Your position will then be long one put with a higher strike price and short one put with your original strike price. In effect, you have rolled out of your long put position into a bear put spread (see Chapter 16 for more details). The criteria for the switch in position is the same as initiating a bear spread. If the new position does not meet the criteria for initiating a bear spread, then the position should not be put on. One rule of thumb is to try to buy the higher strike price for about the same price as the combined prices of the two puts you sold. For example, you will try to buy the OEX 560 puts at 5 if you can sell the two OEX 550 puts for $2^1/_2$ each.

This strategy does not require the sharp drop in the UI to make money. It, therefore, puts you in a better position to gain. The sacrifice is that the profit potential is reduced significantly. The net result is that the break-even point is raised and the dollar risk stays about the same, but the maximum profit potential is also reduced. Another way to look at it is that the chance of success has improved, but the return from that success has been reduced.

You may want to also consider this strategy if you now believe that implied volatility will be declining dramatically. A decline in implied volatility will make your current position decline in value even if the price of the UI does not change. You reduce your sensitivity to implied volatility by selling another put. You will still be long vega but not as much.

The fourth strategy for holders of intermediate- or long-term puts is to *sell a near-term put.* For example, you are holding the OEX July 550 put, and the price of the underlying index rises. You could sell an OEX April 550 put, creating a calendar spread (see Chapter 18 for more details). Basically, you are trying to capture the time premium on the near put as a method of lowering the cost of the far put. This strategy is particularly attractive if the near put is about to expire and the time premium is decaying rapidly. Then, if the UI drops, you will still have the original put but at a lower price.

Investors must be very cautious when using this strategy, however, because they have initiated a bullish position. A sharp rally in the UI while you are holding the short near put will probably create more losses in the near put than profits in the far put because of the much higher gamma. Thus, you should be very sure that the market will not plunge lower over the near term.

Another consideration of this strategy is that the far contract is much more sensitive to changes in implied volatility. In effect, you have reduced the sensitivity of your long put by a little amount by selling the nearby put.

If the Price of the Underlying Instrument Drops

If you are now bullish and the price of the UI drops, liquidate the trade and take your profits. There is never any reason to hold a position against your current outlook. You have several choices if you are still bearish:

1. Sell a lower strike and hold your existing put.
2. Sell your existing position and buy a lower strike.
3. Hold your existing put.

The first choice, to *sell a lower strike and hold your existing put*, turns your long put into a bear put spread. This strategy costs nothing except the extra commission, though you may need to post additional margin, depending on the option. You will need to have a margin account if you are going to do this with stock options. You have essentially locked in your profit, but you have retained more profit opportunity. This strategy will be the best if the market only slips a little more or is stable. The bear put spread strategy will have the worst performance if the market plummets. It is not that you will lose money, but that the profits will not be as high as with the two other strategies. The profit potential, though, is reduced to the difference between the strike prices.

For example, you bought an OEX 50 put and the price of the underlying index has dipped. You could sell the OEX 530 put, lock in your profit, and retain the possibility of a further profit of 20 points, the difference between the two strike prices (see Chapter 16 for more details on the ramifications of this strategy).

You might want to consider this strategy if you now believe that implied volatility will be declining dramatically. A decline in implied volatility will make your current position decline in value even if the price of the UI does not change. You reduce your sensitivity to implied volatility by selling another put. You will still be long vega but not as much.

The second and most aggressive approach, called *rolling down*, is to liquidate your current position and buy another put but at a lower strike price. This strategy is best if you are very bearish. Note, though, that the market must slide to below the new break-even point for you to make money on the new position. Thus, a stable or even slightly lower market will cause this strategy to be the worst of the three. For example, assume you bought an OEX 550 put at 5, it currently trades at 15, and the OEX 530 calls are trading for 3. You could liquidate the OEX 550s, take the 10-point profit, and invest 3 in the OEX 530 calls. Notice that you have taken out the money you initially invested and are now investing only your profits.

The third strategy is to *hold your existing position.* This strategy is best if you are looking for a moderate move lower, but it is the worst of the three if the market climbs above the original break-even point. Note that this is the riskiest of the three strategies because it is the only one that could produce a loss on the whole series of transactions. For example, you bought the OEX 50 puts at 5, and they have gone to 15. The other two strategies lock in some of the profit at this point. Holding the existing position will lose money if the price of the OEX pops above the break-even point.

Further changes in the risk/reward situation can be accomplished by changing the number of contracts used in each strategy. For example, you could sell twice as many puts as you have long puts in the bear put strategy. This is obviously a more bullish strategy than writing the same number of puts as you originally bought. The price of the UI could now probably climb, and you would still make a profit. Or how about buying twice as many puts when you roll down? You are now taking a much more bearish stance in the market.

If the Option Is About to Expire

Another consideration is the time left on the position. Time decay accelerates near option expiration. This makes holding options less attractive. Your choices are the same as initiating a new trade. The additional wrinkle is that time decay is a more important consideration near expiration. In general, if you are still bearish, you should roll forward into the next expiration month as a tactic to reduce the impact of the time decay. If you are now bullish, liquidate the trade before all the time premium decays.

Another decision is whether or not to exercise. You will never want to exercise if the option has any time premium. This is because the exercise of the option will cause you to lose the remaining time premium.

In general, it is unwise to exercise if there is a cost to the exercise process. For example, it costs extra commissions to exercise a stock option because commissions must be paid on the short sale of the stock. On the other hand, there is automatic exercise of many futures options where the cost is neglible. In most cases, you are better off buying back the put if the premium is greater than the cost of commissions.

CHAPTER 9

Naked Call Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Naked Call Writing	Bearish	Decreasing Helps	Helps	Hurts	Limited	Unlimited

STRATEGY

Naked call writing is selling a call without owning the underlying instrument (UI). If your portfolio consisted of only a short OEX call, you would be short a naked call. Naked call writing is a bearish strategy. Call writers want the price of the UI to drop so they may buy back the call at a lower price. The best situation for a naked call writer is for the price of the UI to fall below the call's strike price at expiration, thus rendering the call worthless. The naked call writer will have captured all of the premium as profit. Figure 9.1 shows the option chart for a naked call write.

Notice that the naked call write has a limited profit potential, yet unlimited loss potential. However, some studies have suggested that over 70 percent of options expire worthless.

The choice between shorting a naked call or the UI is based on several criteria. Look at the situation at expiration. In terms of price action, the naked call is superior if the price of the UI is at the break-even point down

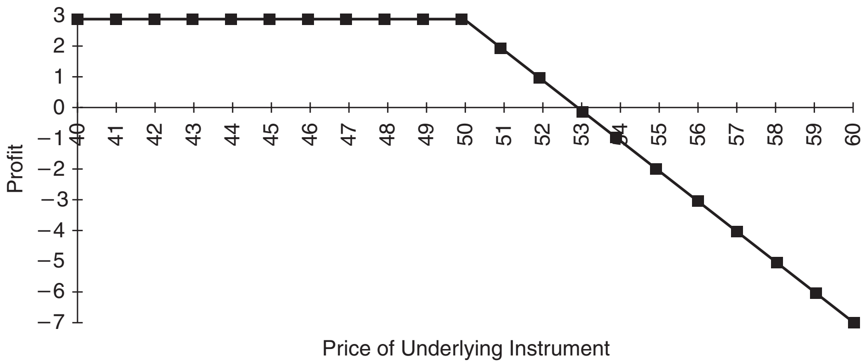


FIGURE 9.1 Naked Call Write

to the strike price minus the call premium. Below that level, the short UI is superior. In other words, a very bearish outlook is better served by shorting the UI, whereas a less bearish outlook is better served by shorting the naked call.

The situation before expiration is different. If you intend to actively manage your naked calls, then selling naked calls can be as attractive as short selling the UI. The use of naked call writes as an attractive substitute for short selling the UI requires active management to mitigate, though not eliminate, the additional risk. The form of the active management is detailed throughout the rest of this chapter.

One advantage of selling a call is that you are not liable for dividend or interest payments, if applicable. In fact, the payment of dividends or interest causes the call to drop in value an equivalent amount and, thus, enhances the profitability.

Another advantage of the naked call is that time is on the side of the naked call seller. As the option nears expiration, the time premium on the call evaporates and reduces the value of the call.

EQUIVALENT STRATEGY

An essentially equivalent strategy can be created by *selling the UI and selling a put.* It is unlikely that you will want to sell the UI and sell the put if you can simply sell the call. Selling the call is easier to execute and will cost less in commissions.

The only time the equivalent strategy makes sense is if you already have one of the two legs on and want to change the character of the trade.

Suppose you are very bearish and sell the UI. Later, you decide the market is not as bearish and might even rebound temporarily. This is the type of situation where you might initiate a synthetic naked call write.

RISK/REWARD

Net Investment

The net investment is the margin required by the broker to carry the position. Each exchange has different rules for devising the margin requirements for the naked call write, and each broker can then boost the margin to a higher level than specified by the exchanges.

Break-Even Point

The break-even point at expiration is equal to the strike price plus the call premium. For example, if the strike is $50 and the call premium is $3, the UI cannot be higher than $53 at the expiration of the call.

Profit Potential

The maximum profit potential is the call premium received when the call is sold. This will occur only if the price of the UI is less than the strike price at expiration. The reason that the maximum profit potential is only reached at expiration is that the option will always have a time premium up to the last minutes of trading. You, therefore, have to let the option expire before the maximum profit potential can be reached.

The naked call will also profit at expiration if the price of the UI lies between the strike price and the strike price plus the call premium. The rule in this case is: The profit equals the call premium plus the strike price minus the price of the UI.

Before expiration, the naked call will be making money if the price of the UI has dropped since the naked call write was initiated, assuming all other factors remain the same. The profit (or loss) can be estimated by the delta of the option. For example, if you sold an option for $5 with a delta of 0.50, the option will be close to $3 if the price of the UI has fallen $4. Note that deltas change as the price and implied volatility change. This means that you can only *estimate* the future value of the option, not pinpoint it precisely.

A drop in implied volatility can increase profits. This occurs because the price of an option is largely determined by the implied volatility. A reduction in the implied volatility will reduce the value of the options, thus creating a more profitable situation for you. In fact, you can make money on a naked call if the implied volatility drops and the price of the UI stays the same. You need an options valuation model to determine the effect of the shift.

Potential Risk

The risk in holding a naked option is unlimited. As a practical matter, of course, you should be taking defensive measures before losses climb out of sight. The main risk is that the price of the UI will rally while you are short the call. The dollar risk can be estimated by multiplying the option delta by the price change of the UI. For example, you will lose $3 if the delta is 0.30 and the UI rallies $10.

One risk is that an American-style option will be assigned before you wish to exit the trade. This risk is largely controlled by your selection of strike price. An in-the-money option has a chance of early exercise, whereas an out-of-the-money option has very little chance of early exercise.

An increase in volatility will hurt your position because it will increase the value of the option. For example, assume an at-the-money option on a $50 instrument with 90 days to expiration and implied volatility of 10 percent. This option will be worth about 0.98. An increase in implied volatility to 15 percent will boost the price of the option to $1.47 without any change in the price of the UI.

DECISION STRUCTURE

Selection

Market outlook is critical to the selection of the option to write. The more bearish you are, the lower the strike price you will select. The reasons for this are that the delta will be higher for a lower strike price than for a higher strike and that the premium is higher, thus affording greater profit potential. A more defensive posture is to sell at higher strike prices. An out-of-the-money option has less chance of being in-the-money at expiration than an in-the-money option. The trade-off is that the premium and, hence, the profit potential are less.

One strategy is to sell options that have a strike price outside the range suggested by the implied volatility in the relevant time period. For example, the Swiss franc is currently trading at 61.00 and implied volatility suggests that prices will trade in a range of 1.83 higher and lower than 61.00. This suggests selecting a call at least 1.83 higher than the current market price, perhaps the 63.00 call. A more conservative approach would be to sell a call even higher, perhaps twice the range suggested by the implied volatility.

Implied volatility has a major impact on the selection of the UI against which to write a call. The best strategy is to sell options that have a high implied volatility, looking for both prices and volatility to fall. It is very helpful to keep a record or graph of the implied volatilities for the recent past. This will provide a perspective on the volatility of the call you want to write. In general, you will want to write calls that have a high implied volatility rather than a low implied volatility. Further, you want to write calls that you believe are overpriced.

This is an important point. Selling options that are consistently undervalued means that your naked option selling is swimming against a strong tide. You will have to be right more often on the direction of the market than if you are consistently selling overpriced options.

Selling a call is a way of selling time premium. Selling calls is most attractive, all other things being equal, when there is little time left before expiration. Time decay is limited in the first days after an option is listed. As time progresses, the time decay accelerates, making selling options more attractive the more expiration approaches. In particular, time decay accelerates in the last six weeks of trading. You will be earning the time decay every day.

If the Price of the Underlying Instrument Drops

If the UI price drops and you are no longer bearish, simply liquidate the trade and take your profits. If you are still bearish, you have three possibilities.

1. Hold your current position.
2. Sell your current position and buy a lower strike.
3. Sell your current position and buy a longer term option.

First, continue to *hold your existing position.* This can be a very attractive proposition if the call is out-of-the-money and there is little time left before expiration. This strategy is also suited to a market stance that is only slightly bearish. Time decay is likely increasing, thus enhancing the profit.

A more bearish market stance would suggest *rolling down to a lower strike price.* This will give you more profit potential because the delta and the premium will be higher. It would be best to examine the new strike to see if it makes sense as a new position. Note that you should preferably be looking for implied volatility to move lower. The lower strike will have a greater sensitivity to implied volatility.

If the option is about to expire, you can *roll forward to a farther expiration date*. The selection of which option to roll forward into will be related to your market outlook. Note that you might not want to liquidate your existing call if the time premium is falling rapidly and there is little chance for the option to go in-the-money. In this circumstance, you might want to take a larger risk and sell options on the next expiration while still holding the nearby options. The reward is that you will capture the time premium on the nearby options while holding your longer term position in the farther contract. The risk is that the market will rally sharply, and you will lose money on both the nearby and farther options simultaneously.

In any case, rolling forward will cause the position to be much more sensitive to vega. Once again, you should be bearish on implied volatility and be looking for it to be lower in the future.

If the Price of the Underlying Instrument Rises

If the market is moving against you and you look for it to continue to do so, liquidation of the position makes the most sense. Otherwise, consider these strategies:

1. Buy the UI.
2. Sell the current option and buy a farther expiration.

The first plan, if you have turned bullish, is to *buy the UI*. You will have converted the short call into a covered call write. The critical question is whether to buy a UI in the same quantity as the short call or in a delta-neutral quantity. Using the same quantity is more bullish than placing positions in a delta-neutral quantity (see Chapter 10 and Chapter 11 for more details).

However, the problem with this strategy is that it is likely that the profit potential is not particularly high. After all, the call has gone up in value because the UI has rallied in price. The call might be in-the-money now. It is even possible that initiating a covered call write might actually lock in a loss. This strategy must be examined closely before entry.

If you think the rally is temporary, you could continue to hold your current position or roll up. Holding the current position is more aggressive than rolling up. The lower strike will have more risk and reward than the higher strike. Rolling up will also make the position more sensitive to changes in vega, so you should preferably be looking for implied volatility to decline.

If the option is about to expire and you are still bearish, you can *roll forward.* The selection of which strike to sell will follow the guidelines outlined under Selection. One decision you will need to make is whether to liquidate the current position and the attendant sharp decay in time premium or to sell the far options and hang on to the current position. The question comes down to your market outlook. Will the price rally more than the time decay? If so, roll forward. If not, hang onto the current position and sell the next expiration option.

Furthermore, rolling forward will increase the sensitivity to implied volatility. An option that is about to expire has little vega, whereas a longer dated option will likely have a significant vega. Thus, you will want to have an opinion on vega before rolling forward.

CHAPTER 10

Covered Call Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Covered Call Writing	Bullish	Decreasing Helps	Helps	Hurts	Limited	Limited

STRATEGY

Covered call writing is being long an underlying instrument (UI) and being short a call on that UI.

The following chart shows the various calls available and the instruments against which the call could be written:

Stock Indexes	Stocks	Futures
Cash portfolio representative of the stock index Call with lower strike price and same expiration Long futures contract	Underlying stock Call with lower strike price and same expiration Convertible securities	Cash instrument/ commodity Futures contract Call with lower strike price and same expiration

(*Bull call spread* is the name for writing a call against another call with a lower strike price. Further details concerning bull call spreads will be presented in Chapter 15.)

The quantity represented by the number of calls sold is equal to the quantity of the UI. For example, covered call writing using options on Eastman Kodak will have one short-call option for every long 100 shares. Another example is selling one Treasury-bond option against the purchase of one Treasury-bond futures contract. (*Ratio call writing*, the strategy of using differing quantities of the UI and call options, is outlined in Chapter 11.)

There are three main reasons behind writing covered calls:

1. To partially hedge existing position against price decline.
2. To increase return on existing long position.
3. To furnish an opportunity for profit.

EQUIVALENT STRATEGY

The *naked put write* can be substituted in many cases for a covered call write, particularly with instruments that pay dividends or interest. There are several main considerations for deciding whether to naked put write or covered call write. The first is commissions: Commissions will be significantly higher for covered call writing than for naked put writing. The second consideration is the total return from the investment: A covered call write on stocks or debt instruments may have a dividend or interest payment that can boost the return beyond the higher cost of commissions. The third consideration is that you may already be long the UI, so that covered writing may be the only practical action. The alternative would be to sell the UI and initiate a naked put write. It may be cheaper in commissions to simply sell the calls against the instrument than to liquidate, and then start a new position from scratch.

RISK/REWARD

Maximum Profit Potential

The *maximum profit potential* is equal to the strike price of the option minus the UI price plus call price.

$$\text{Maximum profit potential} = \text{Strike price} - \text{UI price} + \text{call price}$$

Suppose you want to enter into a covered call writing program using the OEX stock index against a portfolio of stocks that mimic the OEX. (The OEX is an index composed of 100 large NYSE stocks. It is possible to mimic the index by buying all the stocks in that index in the proper proportions.) If the underlying stock portfolio is bought for cash, carrying costs are only the dividends received on the portfolio. Margin costs must be subtracted if the portfolio is bought on margin. For example, assume the following:

A $1 million portfolio of stocks that mimic the OEX
Dividend yield = 5 percent
Strike price = 150
Stock index price = 149
Call price = 4
Transaction costs = $16,000
Broker loan rate = 12 percent
Hold the trade for three months

The maximum profit potential will be the strike price (150) minus the stock index price (149) plus the call price (4). The result is 5. In the actual transaction, you would hold 67 contracts of the OEX ($1 million ÷ 149 = 67 contracts, rounded off). You profit is 5 (the maximum profit potential) times the 100-point value of the OEX times the 67 contracts. This equals a $33,500 profit.

Because calls can be written against a variety of UIs, the transaction costs and carrying costs will vary. For example, a covered call program for stock indexes can have calls written against a portfolio of stocks, a long call with lower strike price, or a portfolio of convertible securities that relate to the stock portfolio underlying the stock index option.

Break-Even Point and Down-Side Protection

Covered call writing partially hedges both up and down price moves. Figure 10.1 shows the profit/loss diagram for a covered call at expiration. The short call limits the profit potential of the long UI, but it buffers the long position from losses by the amount of the premium only.

Losses may be reduced but not limited. Losses are reduced because you receive the call premium, which buffers you from the full value of a price decline. Covered calls show significant losses as the UI falls below the break-even point. The maximum theoretical risk occurs when the value of the UI falls to zero.

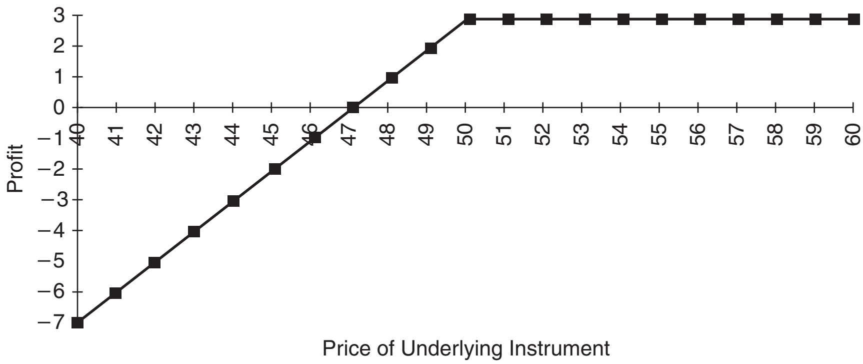


FIGURE 10.1 Covered Call Write

On the other hand, covered call writing does have limited profit potential. Figure 10.1 shows how the total profit is limited when the UI price rises above the maximum gain level. At that point, gains in the UI are matched dollar for dollar with the losses in the short call at expiration.

The break-even point is critical for evaluating potential investments. The break-even point shows the amount of downside protection that the covered call position provides. One advantage of covered call writing over many investments is that it is possible to reduce the break-even point to below the initial entry level.

The formula for the simple break-even point is:

$$\text{Break-even point} = \text{UI price} - \text{call premium}$$

For example, using the assumptions given in the previous section, the stock index price minus the call premium is $149 - 4$, or 145, which is the break-even point.

Figure 10.1 shows the break-even point for this example. Note that you bought the stock index at 149, but you will not lose money unless the index is below 145 at the expiration of the option. For example, suppose the stock index is at 148 at expiration. This means that the call options will be worthless, but you will have the 4 that you received when you sold the option. However, you will have to pay the owner the difference between the current value of the stock index and the strike price, in this case 2. This leaves you with a 2 profit from the sale of the option minus the 1 loss on the purchase of the stock index, for a total profit of 1.

You can lose money before the expiration of the contract if the price of the stock index declines. For example, suppose the stock index went to 145 the first day after initiating a covered call position. The value of the call will have dropped below its initial 4 price but not enough to offset the decline in value of the stock increase because the delta is less than 1.00. This occurs because the value of the call is composed mainly of time value rather than intrinsic value. The decline will be greater if the option is in-the-money because it will have more intrinsic value.

The break-even point is affected by the type of account and transaction. The trade can take place using cash or on margin. *Margin*, in this context, means borrowing money to buy more stock. Transaction costs for margin trades will be more than for cash trades. Additional carrying costs for trades on margin include the financing for the additional stock. The carrying cost for a cash transaction will only be the opportunity cost.

Remember that the simple break-even point describes the situation only at the expiration of the option. Before then, the break-even point changes with time. The break-even point on the first day in the trade is the entry level. Over time, the breakeven point will drop below the entry level. The time value of the call decays, creating the profits that reduce the break-even point. This shows that a covered call program can stack the odds in your favor.

The down-side protection specified by the break-even point is affected by the strike price of the call. A covered call using a lower strike price write will have greater down-side protection than using a higher strike price. The greater premium income provides greater down-side protection.

Net Investment Required

The *net investment required* for a stock trade in a cash account is the money necessary for purchase of the UI. The sale of the call is a credit to your account, though you must keep the money in your account. Suppose you sell an April Widget 65 call at $4 against stock bought at $62. The simple net investment required is:

Cost of stock	$6,200
−Option premium received	−400
Net investment required	$5,800

The net investment required for a margin account is the capital for the leveraged purchase of the underlying stock. The sale of the call is a credit to your account in this case as well.

The investment for a covered write in futures is the premium of the option (marked to the market) plus whichever is the greater of these two: (1) the underlying futures margin minus one-half of the amount that the option is in-the-money or (2) one-half the amount of the underlying futures margin.

The Investment Return

There are two major ways to calculate the return on your investment. Each presents a different perspective on the proposed trade. Both should be examined before initiating a position.

Return-if-Exercised The *return-if-exercised* is the return on the investment if the UI is called away. The return-if-exercised depends on the type of option and the price action after trade entry. An out-of-the-money option must have the UI price rise to above the strike price, or there is no return-if-exercised. This is because the option will not be exercised if it is out-of-the-money, and thus no return-if-exercised. An in-the-money covered write only requires the UI price to remain unchanged. You will receive the return-if-exercised for an in-the-money covered write even if the UI price is unchanged. The return-if-exercised is the same as the return-if-unchanged (see next section) for an in-the-money write. Remember that the deeper in-the-money the option is, the higher the probability that the return-if-exercised will actually be attained. Comparing the relative merits of different strike prices used in covered writes requires an assumption about the direction of prices.

To look at an out-of-the-money covered write, suppose again that you are selling an April Widget 65 call at $4 against your long 100 shares at $62. After the net investment required is known, the return-if-exercised can be calculated:

Proceeds from stock sale	$6,500
− Net investment required	−5,800
Net profit	$700

Return-if-exercised = 700 ÷ 5,800 = 12.0%

The return-if-exercised in this example is 12 percent. You should also look at the annualized return for better comparison with other investments. Suppose you held the Widget covered call position for three months. Your annualized return would be 48 percent (12 percent return for 3 months, or one-fourth of a year, is equivalent to 48 percent return for one year).

Return-if-Unchanged The return-if-unchanged is the return on your investment if there is no change in the price of the UI from date of entry to expiration. This method of calculating return has a major advantage over the return-if-exercised–it makes no assumption about future prices. It gives a closer approximation of the return you should expect, assuming a large number of trades. The return-if-unchanged is the same as the return-if-exercised for an in-the-money write. The simple return-if-unchanged is:

Proceeds from stock sale	$6,200
− Net investment required	−5,800
Net profit	$400

Return-if-unchanged = 400 ÷ 5,800 = 6.9%

The annualized return would be 27.60 percent if the return-if-unchanged is over a three month period.

Additional Income

You may receive additional income if you have the opportunity to compound some of the income received during the covered call position. For example, you may receive dividends or interest from your covered call before the end of the trade. These payments can be reinvested and compounded. However, this will only be a minor source of additional revenue and will not likely be a factor in your decision to invest in a particular program.

ORDERS

It is usually best to enter covered call writes as a contingency order, sometimes called a net covered writing order. A *contingency order* instructs the broker to simultaneously execute the purchase of the UI and the sale of the call at a net price. Use these orders for both entering and exiting covered writes. Some brokers may have a minimum order size for accepting these orders.

Order entry is important because almost all options are traded on an exchange that is different from the one on which the UI is traded. The only major exception is options on futures, where the option is traded in the pit next to the UI. For example, cattle options are traded just a few feet away from the cattle futures pit; but IBM stock is traded around the world, but not at the CBOE, where the option is traded.

The separation of the options exchange and the exchange where the UI is sold makes it more expensive and awkward to execute orders. The brokerage house will not guarantee that the contingency, or net covered call write, orders will be filled. They will try to fill the order at the market bids and asks. The broker may even try to leg into the trade. However, the broker will not fill the order if the risk of loss is too high.

Unfortunately, you may sometimes have to use orders other than contingency orders. This mainly occurs when the UI and the option trade on different exchanges.

The alternative to the contingency order is the *market order*, which guarantees a fill but does not guarantee that the prices will be acceptable. Your expected returns may be significantly altered. You are looking for a particular return when writing calls. Any return less than expected might induce you to discard the trade. This means you should always use contingency orders even if you cannot initiate a position. At least you will get the expected price and return.

The use of the contingency order has one wrinkle. The order is placed by giving the net price of the covered call. For example, you may see a good opportunity by doing a covered call write on 100 shares of General Widget. The stock is currently trading at $62, and the option is at $4. The net price you want is $62−$4, or $58. Although unlikely, the net order could be filled at $63 and $5 or at $59 and $1. Your analysis has been predicated on getting $62 and $4. In most cases, you will get a quote on the covered write, and your order will be filled close enough to that quote so it does not substantially change the outcome of the trade. In a fast-moving market, however, the fill on the order could change the risk and return of the trade. A fill at $59 and $1 gives very little down-side protection but more profit potential; the fill at $63 and $5 gives greater protection but less potential. In addition, the return-if-exercised remains stable, but the return-if-unchanged and the break-even point have changed dramatically.

WRITING AGAINST INSTRUMENT ALREADY OWNED

Covered call writing profits are relatively small, and the costs of trading need to be carefully monitored. Writing calls against your existing portfolio might increase the yield of covered call writing because you have already paid the commission to enter the UI. You do not have to pay a commission to buy the UI. This can have a large percentage impact on your return. Be sure to compare the returns of various writes after taking into account the commission savings of using a UI you already own. The returns of selling against what you already own will often be greater than starting a trade from scratch because of the commission savings.

PHYSICAL LOCATION OF UNDERLYING INSTRUMENT

The physical location of the UI affects the net investment required. In the preceding examples, it was assumed the UI was on deposit with the same broker selling your calls. No additional margin deposit is required if you write calls against a UI that is being carried by the same broker. For example, you might write a sugar call against a long sugar futures position without investing any further money if the futures contract is being carried with the same broker who is executing the short call. In most cases, you will be initiating the long and short at the same time; the short call will not increase your gross investment.

This does not apply if the UI and the call are traded on two different exchanges. Then, each side of the write must have the full requirement even if they are traded with the same broker.

However, you might have stock that you cannot or will not deposit with a broker. There are ways that you can still write calls without increased investment. You might deposit the stock with a bank, which will issue an escrow receipt or letter of guarantee to the brokerage house. The brokerage house must approve the bank before accepting the letter of guarantee, and not all brokers accept guarantees. In addition, the bank will charge you for the letter of guarantee. This generally makes it too expensive for small traders.

Another method is to deposit your stock with a bank that is a member of the Depository Trust Corporation (DTC). The DTC guarantees to the Options Clearing Corporation (OCC) that it will deliver the stock if the short call is assigned. This is the method used by most institutional covered writers. The cost might be zero, but only a few banks are members, and they tend to be located in major cities.

DECISION STRUCTURE

The decision structure for a covered call program has the usual strategy and two follow-up strategies. However, the selection of a covered call is dependent on the rationale behind the trade. Each reason has a unique selection structure. One factor affects all three strategies.

A change in implied volatility will affect the price of the written call. Your preference should be to write options that have a high implied volatility, with you expecting declining volatility.

The worst circumstance would be to write a call with low implied volatility with the expectation of increasing volatility.

At the same time, you might want to consider selling options with high time decay. These will have the quickest profits.

What Is Your Strategy?

The three main reasons behind covered call writing are:

1. To partially hedge existing position against price decline.
2. To increase return on existing long position.
3. To furnish an opportunity for profit.

Hedge Existing Position The first strategy is to write a call against a UI that you think is going to drop in price near-term but will move higher long-term. The idea is that the option premium will protect you against the price drop without having to post any additional funds. Besides that, you might make a little money on the decay of the time value. However, remember that selling a call might mean that you will have to give up your long position if the call is exercised. You might have protected a position you will no longer have. In fact, the short call will protect the UI price against a small price drop, but the strategy falls apart if the market rallies. Your instrument will be called away if the call is exercised. You wanted to carry the instrument until a particular time, but the market took it away early. To partially protect against this, use an option that does not expire until after you want to liquidate the short call. Look at other hedge strategies, such as buying puts (see Chapter 8).

This strategy implies the sale of an in-the-money call to provide protection. The amount of protection will be determined largely by the delta of the option selected. The only way to protect against the whole expected price drop would be to select the quantity of the in-the-money call that has a delta that will cover the expected price drop. However, please remember that very in-the-money calls often have poor liquidity and that entering and exiting the short call may be difficult.

Increase Return The second strategy is to increase return on an existing position. Where do you think the price of the UI is going? If you are long-term bearish, get out of the UI and invest in something else. If you are bullish, treat the covered call write as a separate trade and follow the decision outlined in the next section. When you write a call against an existing position, you are no longer in that existing position. Many investors psychologically cling to the long position and do not realize that the sale of the call means that they have liquidated a long position and simultaneously initiated a covered call write. These are two separate trades with differing risk/reward characteristics and decision structures.

Selling a call is a powerful way to increase returns on a UI that has a predetermined sell point. Selling a call at the strike price that corresponds to the sell point increases your returns by the amount of the premium while reducing the risk. Selling a call is essentially preselling your long instrument. When the instrument rises to your target price, the call buyer may call away your instrument. The critical problem is identifying a valid target sale price.

It is a problem when you have an objective that is above the highest strike price or when the premium for the strike price at your target is very low. A premium worth only $50 is not high enough to sell. It is probably a better strategy in this case to sell a strike price close to the current UI price and continually roll up by selling additional calls as the UI price climbs to your objective. Selling additional calls essentially changes this from a covered call to a ratio covered call. It is essential that you roll up for a credit; otherwise, you are not increasing your returns.

Alternately, roll up by buying back the current short call and sell a higher strike price. You will be buying back the original call for a loss and then selling a higher strike. Eventually, you will not have to sell another call because the market is no longer moving higher or because you have reached your target and are willing to have your stock called away.

Furnish Opportunity for Profit The third strategy is to furnish an opportunity for profit. First, determine your market attitude. A stable market outlook is the best time to sell calls if premiums are high. Do not write calls if you are bearish on the UI. If you are very bullish on the UI, sell out-of-the-money calls (or wait until later to sell the call). This will give you the greatest profit potential, although you will give up some downside protection. An alternative strategy for the very bullish is to not sell as many options as UIs. For example, sell three calls against your 400 shares of United Widget. If risk protection is more important, sell in-the-money calls. You will be cutting your potential return, but you will not have as great a risk of loss as selling out-of-the-money calls. Be careful that you are not cutting your potential return to such a low level that it does not compensate for the risk. Your subjective criterion of risk/profit potential, combined with the range of available in-the-money and out-of-the-money options, gives you the ability to fine tune your covered call program.

Call Writing Considerations

You need to consider at least three statistics when covered call writing: break-even point, return-if-exercised, and return-if-unchanged. Annualize the return figures to make them easier to compare with each other and other covered writes. Comparing annualized returns is useful, but those yields are not engraved in stone. You must evaluate the probability of those returns being achieved. You might find one covered call with an annualized return-if-unchanged of 40 percent and another one of only 20 percent, but the second covered write is a better investment if your estimation of the chance of success for the first one is only 30 percent, whereas the chance for the second write is 80 percent.

Another consideration is the down-side protection of the proposed trade. You need to find the right combination of profit potential with risk protection. Filter the universe of potential writes to those that provide the minimum amount of desired protection.

One way to rate these writes is to take the potential profits and divide them by the down-side protection to get an idea of the risk/reward ratio. Then use the implied volatility to estimate the expected price range. You will now have a good idea of the probability of both the profit and loss occurring.

If the Price of the Underlying Instrument Drops

If the UI price drops, there are two choices:

1. Liquidate the trade; or
2. Roll down.

The preferred choice is to *liquidate the trade* if you are now very bearish and think the price of the UI will never move back above your break-even point.

The second choice, *rolling down*, can provide additional protection while keeping the possibility of profit should the market move back up. It is called rolling down because you buy back the original call and sell a call with a lower strike price as the price of the UI moves lower. The additional premium provides additional down-side protection, though profit potential becomes more limited. If the price of the UI continues down and you keep selling calls, you may reach a point of locking in a loss. The question then becomes: Is the loss from rolling down bigger than the loss of letting my current position ride? Remember, you are in effect initiating a new position, so the criteria for entering a new position apply.

For example, you are long Widget futures at 190 and short a June 180 call at 18. Your down-side protection extends down to 172 (excluding transaction costs and carrying charges). Two weeks later the government releases its Widget crop report that shows large plantings of Widgets. The price of Widgets declines to $172, while the June 180 call drops to $2 and the 160 call is trading for $15. You have lost two points on your position and have reached the break-even point. The price of Widgets will have to be unchanged for you to split even. You have little protection left in your June 180 call, but you can increase protection by selling the June 160 call and buying back the June 180 call.

After this transaction, you have down-side protection to $149 because you sold a net premium of $13 (the price of the June 160 call, $15, minus the price of the June 180 call, $2). The premium collected is subtracted from the original break-even point to derive the new break-even point. Notice you will make 13 points at the current level if the Widget price is unchanged. Rolling down gained additional protection and a chance to make money at the lower level. If you stuck with the original position, you would have made only the 2 points remaining on the June 180 call.

The problem with rolling down is that you are reducing your profit potential. You have agreed to have your Widget future called away at $160 rather than at $180. The following chart shows the results of the original write and the rolled down position. Figure 10.2 shows the option chart for the same two strategies. You have, in effect, swapped additional protection for reduced profit protection.

Price at Expiration	Original Write	Rolled-Down Position
140	−32	−17
150	−22	−7
160	−12	3
170	−2	3
172	0	3
180	8	3
190	8	3

The key is when, if ever, to roll down. This is a market-timing decision. Liquidate the trade if you have turned bearish. If you are still bullish, the time to roll down might be at the original break-even point, a technical support point, or a money-management point.

The real problem arises when the price drops quickly, you do not respond quickly enough, and the market presents you with only an opportunity to roll down and lock in a loss. This is more likely with out-of-the-money writes because they provide less down-side protection. The choice might simply be to lock in a small loss rather than carry the risk of a much larger loss. Be alert to negative price moves, and have a rolling-down plan

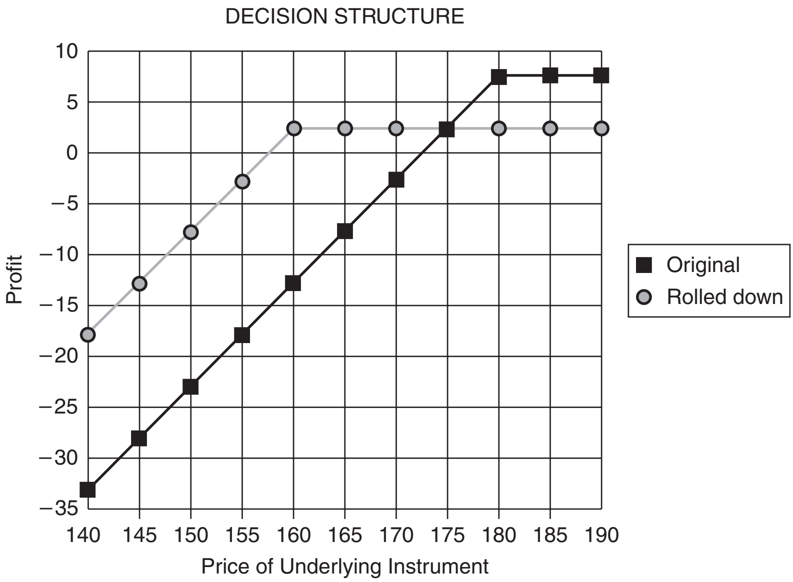


FIGURE 10.2 Rolling Down

firmly in place before initiating the original write. There are three other ways to roll down:

1. Roll down part of your position and keep part in the original call. This increases your down-side protection but gives higher profit potential than rolling down the entire position. This position will increase your sensitivity to implied volatility, so you should be neutral to bearish on vega before rolling down.
2. Keep the original write, then write another call at the lower strike price. This becomes, in effect, a ratio write with two strike prices. You will be short two calls against one long UI (see Chapter 11 for more details on the strategic implications and the risk/reward characteristics). Once again, the position will be more sensitive to changes in implied volatility.
3. Roll down and forward, that is, buy back your original call and sell a call at a lower strike price and in the next expiration month. This has the advantage/disadvantage of giving more time for your trade to work/backfire. One possibility is to partially roll down and forward—keep some of your original write, and roll down and forward some into the next expiration month. Note that rolling down and forward restricts the maximum profit potential for a longer period of

time. Rolling forward tends to significantly increase the sensitivity to changes in implied volatility.

If the Price of the Underlying Instrument Rises

If the UI price rises, the first choice is to liquidate the trade and take the profit you had planned. This is particularly attractive if the return comes quickly. There are two other possibilities:

1. Let the instrument be called away; or
2. Roll up.

In the first possibility, the instrument will likely be *called away* from you if the price of the UI rises above the strike price. This is simply another way of liquidating the trade. When the call is exercised, you will have disposed of the call and the UI at the same time (unless you decide to hold the UI and acquire another to deliver). You will receive the return-if-exercised on the trade.

In many cases, it is better to roll forward rather than have the UI called away. You will be saving commissions and, as was pointed out earlier, this can increase the return significantly. You will certainly want to roll forward if there is not much time premium left and if you are still bullish or neutral.

Writing a futures option on a cash market position presents a further step in the analysis. In this case, you may have the call exercised and be short a futures contract against the still-existing cash market position. For example, you write a Treasury-bond futures option against your cash position of a $7^1/_4$ percent long bond. Your call is exercised and you are left holding a short bond futures position. You can hold the short futures and long bond position, liquidate the futures and hold the long bond, or liquidate both.

Your decision will be based on your market outlook. A bearish outlook would suggest liquidation of both in most cases. A bullish outlook would suggest liquidating the futures and holding on to the long bond.

If the short futures position was delivered to you at a price that was higher than you felt was reasonable, you might want to hold the long bond/short futures position until the price relationship between them moves back into line with your analysis. Remember, the long bond/short futures should be considered a new trade, not an extension of the covered call write.

The other possibility if the UI price rises is to *roll up*. This means writing more calls at higher strike prices as the price of the UI rises, while buying back the original short call. The key is market timing. You should keep writing calls as the market moves higher, but not to the point where the price begins to drop.

Rolling up increases the maximum profit potential at the expense of the break-even point. Whereas rolling down is a credit transaction and you receive cash, rolling up is a debit transaction and you must pay additional cash. The break-even point is raised by the amount of the debit. However, you could combine the rolling up with rolling forward to the next expiration month as a potential tactic to reduce the debit.

The following is an example of a price rally, starting with the covered call described in the earlier rolling-down section (see Figure 10.2). Now the widget futures contract is up to $200, the June 180 call sells for $25, and the June 220 call sells for $8. Rolling up will cost you $17: buying the June 180 at $25 and selling the June 220 at $8. The following chart shows the new profit/loss picture. Figure 10.3 shows the results of the two tactics.

Price at Expiration	Original Write	Rolled-Up Position
160	−12	−32
170	−2	−22
180	8	−12
190	8	−2
200	8	8
210	8	18
220	8	28
230	8	28

If the Option Is About to Expire

You are faced with several decisions if your calls are about to expire. The time premium will have essentially vanished. There is no desirability to holding a short call if the time premium is gone. You should either liquidate the trade or roll forward and/or up. The decision is largely based on your market expectation. If your covered call position is *profitable*, you need to ask if your attitude on the market is bullish or bearish.

1. If you are bullish, roll forward into the next expiring option month if the premium levels are attractive. You are initiating a new position, so the criteria for entering a new position apply. For example, you need to decide if an in-the-money or out-of-the-money call is appropriate.

   A criterion for determining if you should roll forward is the return per day. However, it is only applicable for rolling forward into the same strike price. For example, you may be able to make $435 for the 23 days

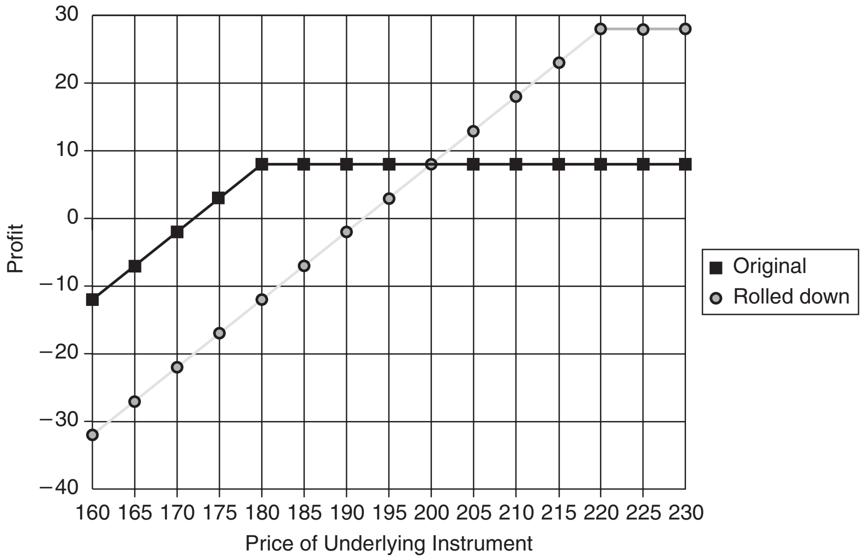


FIGURE 10.3 Rolling Up

left on your current write, but $1,919 on a write on the next expiration month that expires in 83 days. Your return per day on the current write is 435÷23, or $18.91, whereas the write on the next expiration month returns 1,919÷83, or $23.12.

2. If you are bearish, you should probably liquidate the trade. It is rarely wise to carry a covered call when you are bearish unless you are expecting a slight and temporary dip in the market. You can always write another call on the next expiration cycle when the dip is over.

If the option is about to expire and your total position is *unprofitable*, you have a couple of alternatives: (1) liquidate the trade unless you see an imminent market turnaround; or (2), if you are still bullish, you could roll forward and down.

WRITE AGAINST A CONVERTIBLE SECURITY

It is often more profitable to write calls against convertible securities. The most common convertible security is the convertible bond, though convertible preferreds and warrants are also candidates.

It is important to know the number of shares into which the convertible converts. You can then compute the correct number of options and convertibles to use. For example, a convertible bond may be converted into 20 shares of stock. You will need to own 5 bonds for every 1 call representing 100 shares that you sell. You will also need to know the yield on the convertible and the margin requirements if you intend to finance the purchase.

Compare examples of writing against a convertible and the underlying common: International Business Widgets (IBW) has a convertible bond selling for $123\frac{3}{4}$, the stock is at $151\frac{1}{2}$, and the IBW May 155 calls are selling for $4\frac{3}{8}$. Each bond is convertible into 6.5 shares. This means that 200 bonds will give 1,300 shares after conversion. Examples 10.1 to 10.6 show the results of writing against the common versus writing against the cash. Assume that there are no financing costs and that you will hold the write for one month.

Example 10.1 Net investment required–Common

Cost of stock	$196,950
+ Stock commissions	+1,300
− Options premium received	−5,688
+ Options commissions	+390
Net investment required	$192,952

Example 10.2 Return-if-exercised–Common

Proceeds from stock sale	$201,500
− Stock commissions	−1,300
+ Dividends (0.2%)	+395
− Net investment required	−192,952
Net profit	$7,643

Return-if-exercised = 7,643 ÷192,952 = 3.96% (47.53% annualized)

Example 10.3 Return-if-unchanged–Common

Proceeds from stock sale	$196,950
− Stock commissions	−1,300
+ Dividends (0.2%)	395
− Net investment required	−192,952
Net profit	$3,093

Return-if-exercised = 3,093 ÷ 192,952 = 1.60% (19.24% annualized)

Example 10.4 Net investment required–Convertible

Cost of bonds	\$247,500
− Options premium received	−5,688
+ Options commissions	+390
Net investment required	\$242,202

Example 10.5 Return-if-unchanged–Convertible

Proceeds from bond sale	\$253,218
+ Coupon yield ($7^7/_8$% coupon)	+1,312
− Net investment required	−242,202M
Net profit	\$12,328

Return-if-exercised = 12,328 ÷ 242,202 = 5.09% (61.10% annualized)

Example 10.6 Return-if-unchanged–Convertible

Proceeds from bond sale	\$247,500
+ Coupon yield ($7^7/_8$% coupon)	+1,312
− Net investment required	−242,202
Net profit	\$6,610

Return-if-exercised = 6,610 ÷ 242,202 = 2.73% (32.70% annualized)

The net result is that you will have to invest more with the convertible, but your returns are likely to be higher. The convertible return-if-exercised is 61.10 percent versus 47.53 percent for the common. The convertible return-if-unchanged is 32.70 percent versus 19.2 percent for the common.

It should be noted that the return-if-exercised is not as precise for the convertible as it is for the common. Example 10.6 assumed that the premium of the convertible price to the exercise price of the convertible was stable. In this example, there was a 22 percent premium for buying the convertible over the common. The return to exercise can be more or less for the convertible because the premium may expand or contract.

The trickiest part of using a convertible instead of a stock is assignment if the call is exercised. There are two choices: The first is to convert the convertible into common stock and deliver the stock to the call buyer.

This is virtually never a good idea because you will be losing the premium on the convertible. The second and practical choice is to sell the convertible and buy the stock to deliver.

Another concern is to find out whether the convertible is callable and, if so, what the terms are. Your strategy could be destroyed if the convertible is called away and you have to end the covered call prematurely.

DIVERSIFICATION OF PROFIT AND PROTECTION

The goal of your covered call writing is to find covered calls that provide the right combination of profit potential and risk protection. The problem is that the maximum profit potential comes from writing out-of-the-money calls, whereas the maximum protection comes from writing in-the-money calls. Another problem with writing only one type of option is that you are committed to just one strategy, and the potential for the strategy to fail is relatively high. However, you can diversify your portfolio of covered calls by using multiple strike prices. A combination of in-the-money and out-of-the-money options might provide a better balance of profit potential and risk protection. There will be a greater chance of achieving the expected results because you have diversified the potential risks and rewards across a broader array of strike prices.

Another way to increase the chances of achieving your expected return is to diversify through time. You can write calls at the same strike price in different expiration months. For example, you could write the April and July 85 Amalgamated Widget calls.

Combining these two techniques adds another dimension to your strategy. You can fine tune the write program according to your expectations of future prices. For example, you might think that Widget and Associates will be at $25 by April and $35 by July. You could write two out-of-the-money calls: an April 25 and a July 35. Alternately, you could write an in-the-money call at the nearest expiration to provide protection now but write an out-of-the-money call in the next expiration month to provide greater profit potential.

CHAPTER 11

Ratio Covered Call Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Ratio Covered Call Writing	NA	NA	Helps	Helps	Limited	Unlimited

STRATEGY

Ratio covered call writing is being long an underlying instrument (UI) and short more calls on that UI than you have of that UI. For instance, you could be long 100 shares of Xerox and short two calls. The UI could either be the actual UI or a proxy for that UI, such as another call or a convertible bond. Figure 11.1 shows an option chart for a ratio covered call write.

The first, and main, rationale for a ratio covered call write is to capture the time premium of the short calls. This is usually accomplished by buying the UI and selling enough calls to create a delta-neutral position—the sum of the deltas of the short calls will be equal to the delta of the long UI. For instance, you buy 100 shares of AT&T at 25 and sell two AT&T 25 options with deltas of 0.50 each. The delta on the long stock is 1.00, so you need to sell options that have a total delta of 1.00. In this case, you need to sell two options, because their deltas were 0.50.

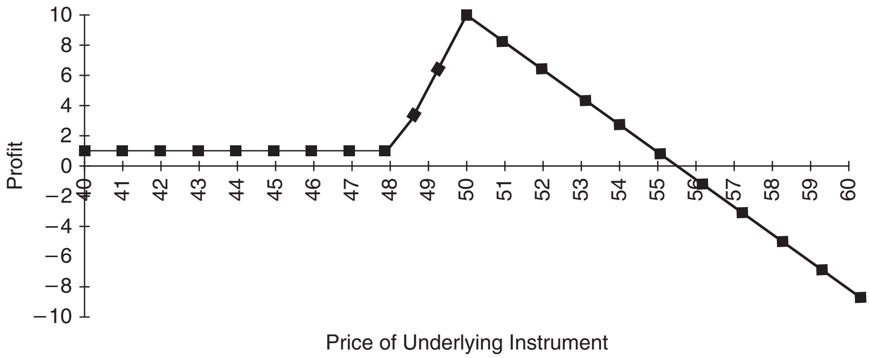


FIGURE 11.1 Ratio Covered Call Writing

Note that you have initiated a position that has a delta of zero. This means that you have no market exposure. This shows that a delta-neutral ratio covered call write is a neutral strategy. You do not care if the market goes up or down, at least initially. Some people think this means they do not have any market risk, when, in fact, they do. The option deltas change as the price changes (see Chapter 3 and Chapter 4 for more details). This means that the position acquires a market risk as the price of the UI changes. The ramifications of this are highlighted later under Decision Structure.

Please note that this strategy is particularly suited for investors with extensive holdings. As will become apparent later (under Decision Structure), the larger the position, the better the trade will work. Ratio covered call writing is not attractive for investors who can only afford a few contracts.

The second rationale for doing a ratio covered write is to capitalize on a skew in volatility. There are often times when the implied volatility of out-of-the-money options is greater than the at-the-money options. You can sell the out-of-the-money options and buy the at-the-money options, expecting the volatility skew to go away or to be reduced.

For example, assume that the Medical Widgets 100 calls have an implied volatility of 23, the 110 calls are at 26, and the 120 calls are at 30. In this case, you would want to "buy" the 100 call volatility of 23 and "sell" the 120 call volatility of 30, looking for the spread to narrow. In other words, you believe that the difference between the implied volatility of the 100 call at 23 and the implied volatility of the 120 call at 30 will narrow. In this case, you can structure a ratio between the 100 and 120 calls such that the position is vega neutral, that is, the sensitivity of the two positions to changes in implied volatility is neutral. You can then use the UI to make the position delta neutral. This strategy is particularly used when you are neutral on the absolute level of implied volatility.

The third major rationale for doing a ratio covered write is to trade implied volatility. This is done using a delta-neutral position. The most popular strategy for trading implied volatility is to use straddles, but ratio writing is also very popular. The ratio write is most often done when the strategist believes that implied volatility is too high. In this case, the position is constructed as a delta-neutral strategy that is net short vega.

EQUIVALENT STRATEGY

There is no equivalent strategy.

RISK/REWARD

A discussion of the risk/reward of a ratio covered call writing program is more complex than nearly all other option strategies. This is because a ratio covered call program is expected to be a dynamic program. The risk/reward parameters that will be outlined apply only to the initial position. The risk/reward characteristics change as the price of the UI and the composition of the position change. For example, losses should be sharply limited on a theoretically perfect ratio covered call writing program that is being dynamically managed, yet there are discussions of risk and break-even points included.

Another critical point is that the risk/reward of ratio writes are highly dependent on changes in implied volatility before expiration. Gamma and theta tend also to be very high in ratio writes and to have a big impact on profitability before expiration, particularly just before expiration.

Investment

The investment will be the same as a covered call write and the sum of the margin requirements of the naked short calls. For example, if you're long one UI and short two calls, you have, for margin purposes, one covered call write and one naked short call.

Break-Even Point

The formulas for the two break-evens for a ratio covered call write are:

$$\text{Up-side break-even} = \text{Strike price} + [\text{maximum profit}/(\text{number of calls written} - \text{number of UIs bought})]$$

$$\text{Down-side break-even} = \text{Strike price} - (\text{maximum profit}/\text{number of UIs bought})$$

For stocks, the number of UIs is the number of round lots that were bought. If you owned 250 shares of stock, you would insert 2.5 in the formula.

Maximum Risk

The maximum risk of a ratio covered call write is unlimited. You will lose a point for every point the UI rises when its price climbs above the up-side break-even *for each call you are short in excess of the number of long UIs*. For example, you will lose two points for every point the UI goes above the up-side break-even point if you are short three calls and long one UI. Clearly, the higher the ratio, the higher the risk.

On the down-side, the risk is usually very low, if not nonexistent. Quite often, ratio writes are initiated with a credit, particularly when written against another call. This means that there is no down-side risk. If it is not a credit spread, then the risk is usually very low.

DECISION STRUCTURE

The decision structure of ratio covered call writing is like trying to hit a moving target because of the dynamic nature. The following comments will identify the major considerations when making decisions.

Selection

A ratio covered call writing program is largely a method to capture the time premium of options. This usually means that the best option to sell is the at-the-money option because it is the option that typically has the most time premium. You will usually be writing two calls for every UI.

The problem with the at-the-money call is that it is harder to fine tune your position when you are carrying only a small position. (This will be discussed in greater detail in the sections on follow-up strategies.) The point to remember here is that you will need more out-of-the-money options to create a delta-neutral position than in-the-money or at-the-money options. The additional options make it easier to adjust your position after entering the trade. This is not a problem when you are carrying a position that contains hundreds of options contracts, but it does present a problem when you are carrying a small position of just a few options contracts.

A change in implied volatility will affect the price of the position, particularly of the written calls. Your preference should be to write options that have a high implied volatility when you expect declining volatility. The worst circumstance would be to write a call with low implied volatility with the expectation of increasing volatility.

When using a ratio write to capitalize on a volatility skew, make sure that there is a history of the skew coming back into line and that the narrowing will create enough profit to cover your transaction costs and reward you for the risk in the position.

If the Price of the Underlying Instrument Changes Significantly

If the UI price changes, in most cases, you will be trying to keep the position as delta-neutral as possible throughout the life of the trade. This will theoretically eliminate price risk as a consideration. In addition, it should maximize the amount of time premium that is captured. The tricky thing is to keep the trade delta neutral. The problem is that the deltas of the options change as the price of the UI changes. If the price of the UI climbs, the delta of the options increases, thus making you increasingly short. A declining UI price will make your position increasingly long. You, therefore, must continually change the number of options you are short.

For example, you are long 100 contracts of the S&P 500 futures contract at 550 and short 200 contracts of the S&P 500 options with a strike of 550 and a delta of 0.50. If the price of the S&P 500 climbs to 560, the delta of the options will climb to, say, 0.55. Thus, you will be the equivalent of short 10 contracts of the futures. This can be found by multiplying the delta of the futures (always 1.00) by the number of futures (100) and subtracting from that result the number of options (200) times the delta (0.55); that is, $(1.00 \times 100) - (0.55 \times 200) = -10$. You will now be exposed to risk if the market continues higher.

You, therefore, must adjust the number of contracts you are using to reduce to zero the net delta of the position. To find the new quantity of options, divide the net delta of the long side by the new delta. In this example, the net delta of the long side is found by multiplying the delta by the number of futures, that is 1.00×100, or 100. The new quantity of options is $100 \div 0.55$, or 181.8, which will have to be rounded to 182. You should then liquidate 18 of your short futures to bring your portfolio to the proper weighting, 182.

Note that you will have to resell those 18 contracts if the price of the UI drops back down to 550. In addition, a further drop in UI price would require you to sell additional contracts.

It should be clear that ratio covered call writing requires active management. You simply cannot go away for a vacation and expect to still have a delta-neutral position. Note also that the more the UI price moves in one direction, the more the delta is moving against you.

A second adjustment should also be made to the position after the UI price has moved. Remember, the point of the trade could be to capture time premium. Therefore, you should roll up or down as the UI price moves from the initial strike price to another strike price. For example, if the price of the S&P 500 futures moves from 550 to 560, you could buy back your 550 calls and sell 560 calls. Conversely, if the UI price should drop to a lower strike price, you should roll down out of your current strike price and into the new at-the-money option.

It is possible that you are not running a delta-neutral program. This would mean that you will likely prefer to see a steady market or, if this is a credit spread, a price move to the down-side. Usually, a steady market is where you will make the most money because the written calls will expire worthless.

The biggest problem comes if the UI price starts to move above the up-side break-even point. You then have significant risk because you will be short extra calls that will be in-the-money. You have several choices: You should liquidate the position if you expect the market to continue higher. You will simply be hurt further by hanging on. It is unlikely that any change in the other greeks will cover your losses due to the rise in the UI price.

Another choice is to cover the position and turn it into a covered call write or a bull spread, rather than a ratio call write. This would be done by buying a lower strike call or buying some of the UI. The idea is that you become net long or delta-neutral. At the same time, you will set up the position so that you will no longer be short gamma. This means that you will not be getting shorter as the UI price goes higher. This is obviously a good idea if you are now short. Still, you should look at this as a new position and only do it if the position makes sense as a new position. (Review the selection criteria in Chapter 10 or Chapter 15.)

Problems with Ratio Writes

There is one major problem with the ratio covered call writing program: How often should the portfolio be rebalanced? Theoretically, you should rebalance every time there is a price change that implies a change of one contract in the delta of the position. The trade-off is that continual adjusting may create too many commissions. This will occur if the price of the UI jumps back and forth in a narrow range. You will adjust your portfolio with every jump in the price of the UI, creating commission expenses; yet the UI price will not really break out of its range.

Unfortunately, there is little that can be done about this, except to not adjust the portfolio as often as would be suggested by keeping the trade delta-neutral. The risk of this tactic is that the market will move enough in one direction to create a market exposure, and you lose money because of this exposure.

In the final analysis, it is probably better to adjust whenever necessary and pay the extra commissions as the cost of not exposing yourself to market risk. The key to the answer to this question is the cost of your commissions versus the price risk of a change in the delta.

If the Option Is About to Expire

You are faced with several decisions if your calls are about to expire. The time premium will have essentially vanished. There is no desirability to holding a short call if the time premium is gone. You should either liquidate the trade or roll forward. The decision is largely based on the premium levels of the next contract month. If premium levels are high, then you should consider rolling forward. If they are low, you should consider doing a ratio covered call writing program against another instrument. In essence, the decision to roll forward is exactly the same as the decision to initiate a new position.

Write Against a Convertible Security

It is often more profitable to write calls against convertible securities. The most common convertible security is the convertible bond, although convertible preferreds and warrants are also candidates. (A complete discussion of using convertibles is included in Chapter 10. That discussion assumes that only the equivalent of one call will be written. To adapt that section to ratio covered call writing, take the analysis in that section but adjust for the delta.)

CHAPTER 12

Naked Put Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Naked Put Writing	Bullish	Decreasing Helps	Helps	Hurts	Limited	Unlimited

STRATEGY

Naked put writing is selling a put without owning the underlying instrument (UI). If your portfolio consisted of only a short OEX put, you would be short a naked put.

Naked put writing is a bullish strategy. Put writers want the price of the UI to rise so they can buy back the put at a lower price. The best situation for a naked put writer is for the UI price to move above the put's strike price at expiration, thus rendering the put worthless. The naked put writer will have captured all of the premium as profit. Figure 12.1 shows the option chart for a naked put write.

Notice that the naked put write has a limited profit potential yet unlimited loss potential. However, some studies have suggested that over 70 percent of options expire worthless.

The choice between shorting a naked put or buying the UI is based on several criteria. Look at the situation *at expiration*. In terms of price

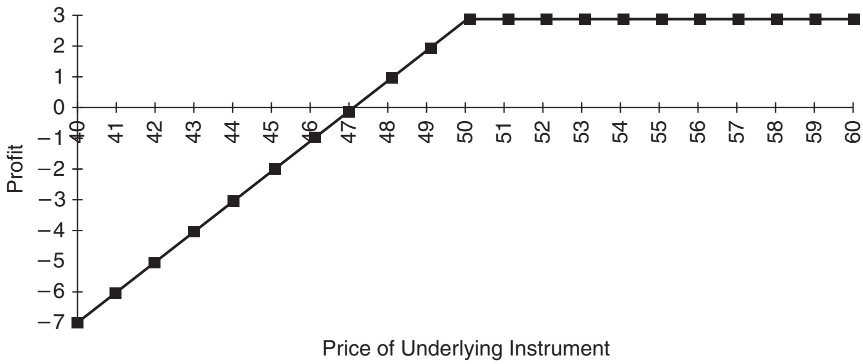


FIGURE 12.1 Naked Put Write

action, the naked put is superior if the UI price is anywhere from the break-even point (discussed later) up to the strike price plus the put premium. Above that level, the long UI is superior. In other words, a very bullish outlook is better served by buying the UI, whereas a less bullish outlook is better served by selling the naked put.

The situation *before expiration* is different. If you intend to actively manage your naked puts, then selling naked puts can be as attractive as buying the UI. The use of naked put writes as a substitute for buying the UI requires active management to mitigate, though not eliminate, the additional risk. The form of active management is detailed throughout the rest of this chapter.

One disadvantage of selling a put is that you are liable for dividend or interest payments, if applicable. The payment of dividends or interest causes the put to gain an equivalent amount in value, and thus reduce the profitability.

An advantage of the naked put is that time is on the side of the naked put seller. As the option nears expiration, the time premium on the put evaporates and reduces the value of the put.

EQUIVALENT STRATEGY

An essentially equivalent strategy can be created by *being long* the UI and *selling a call*. It is unlikely that you will want to buy the UI and sell the call if you can simply sell the put. Selling the put is easier to execute and will cost less in commissions.

The only time the equivalent strategy makes sense is if you already have one of the two legs on and want to change the character of the trade.

Suppose you are very bullish and buy the UI. Later, you decide the market is not as bullish and might even slump temporarily. This is the type of situation where you may initiate a synthetic naked put write.

RISK/REWARD

Net Investment

The *net investment* is the margin required by the broker to carry the position. Each exchange has different rules for devising the margin requirements for the naked put write, and each broker can then boost the margin to a higher level than specified by the exchanges.

Break-Even Point

The *break-even point* at expiration is equal to the strike price minus the put premium. For example, if the strike is $50 and the put premium is $3, then the price of the UI cannot be less than $47 at the expiration of the put.

Profit Potential

The maximum *profit potential* is the premium received when the put is sold. This will occur only if the price of the UI is higher than the strike price at expiration. The reason that the maximum profit potential is only reached at expiration is that the option will always have time premium up to the last minutes of trading. You, therefore, have to let the option expire before the maximum profit potential can be reached.

The naked put will also profit at expiration if the price of the UI lies between the strike price and the strike price minus the put premium. The rule in this case is:

$$\text{Profit} = \text{Put premium} - (\text{strike price} + \text{UI})$$

Before expiration, the naked put will be making money if the UI price has rallied since initiating the naked put write, assuming all other factors remain the same. The profit (or loss) can be estimated by the delta of the option. For example, if you sold an option for $5 with a delta of 0.50, then the option will be close to $3 if the UI price has jumped $4. Note that deltas change as the UI price and implied volatility change. This means that you can only estimate the future value of the option, not pinpoint it precisely.

A drop in implied volatility can increase profits. This occurs because the price of an option is largely determined by the implied volatility. A reduction in the implied volatility will reduce the value of the options, thus creating a more profitable situation for you. In fact, you can make money on a naked put if the implied volatility drops and the UI price stays the same. You need an options valuation model to determine the effect of the shift.

Potential Risk

The risk in holding a naked option is unlimited. As a practical matter, of course, you should be taking defensive measures before losses climb out of sight. The main risk is that the UI price will fall while you are short the put. The dollar risk can be estimated by multiplying the option delta by the UI price change. For example, you will lose $3 if the delta is 0.30 and the UI price drops $10.

One risk is that an American-style option will be assigned before you wish to exit the trade. This risk is largely controlled by your selection of strike price. An in-the-money option has a chance of early exercise, whereas an out-of-the-money option has very little chance of early exercise.

An increase in volatility will hurt your position because it will increase the value of the option. For example, assume an at-the-money option on a $50 instrument with 90 days to expiration and implied volatility of 10 percent. This option will be worth about $0.98. An increase in implied volatility to 15 percent will boost the option price to $1.47 without any change in the UI price.

DECISION STRUCTURE

Selection

Market outlook is critical to the selection of the option to write. The more bullish you are, the higher the strike price you will select. The reasons for this are that the delta will be higher for a higher strike price than for a lower strike and that the premium is higher, thus affording greater profit potential. A more defensive posture is to sell at lower strike prices. An out-of-the-money option has less chance of being in-the-money at expiration than an in-the-money option. The trade-off is that the premium and, hence, the profit potential are less.

One strategy is to sell options that have a strike price lower than the implied volatility suggests as the range in the relevant time period. For example, the Swiss franc is currently trading at 61.00, and implied volatility suggests that prices will trade in a range of 1.83 above and below 61.00. This suggests selecting a put 1.83 lower than the current market price, perhaps the 59.00 call. A more conservative approach would be to sell a put even lower, perhaps twice the range suggested by the implied volatility.

Implied volatility has a major impact on the selection of the UI against which to write a put. The best strategy is to sell options that have a high implied volatility, while looking for prices to rise and volatility to fall. It is very helpful to keep a record or graph of the implied volatilities for the recent past. This will provide a perspective on the volatility of the put you want to write.

In general, you will want to write puts that have a high implied volatility rather than a low implied volatility. Further, you want to write puts that you believe are overpriced. This is an important point. Selling options that are consistently undervalued means that your naked option selling is swimming against a strong tide. You will have to be right more often on the direction of the market than if you are consistently selling overpriced options.

Selling a put is a way of selling time premium. Selling puts is most attractive, all other things being equal, when there is little time left before expiration. Time decay is limited in the first days after an option is listed. As time progresses, the time decay accelerates, making selling options more attractive the closer expiration approaches. In particular, time decay accelerates in the last six weeks of trading. You will be earning the time decay every day.

If the Price of the Underlying Instrument Rises

If the UI price rises, you have four possible strategies. If you are no longer bullish, simply liquidate the trade and take your profits. If you are still bullish, you have three possibilities.

1. Continue to hold existing position;
2. Roll up to a higher strike; or
3. Roll forward.

First, *continue holding your existing position.* This can be very attractive if the put is out-of-the-money and there is little time left before expiration. This strategy also suits a market stance that is only slightly bullish. Time decay is likely increasing, thus enhancing the profit.

A more bullish market stance suggests *rolling up to a higher strike price.* This will give you more profit potential because the delta and the premium will be higher. It would be best to examine the new strike to see if it makes sense as a new position. Please note that you should preferably be looking for implied volatility to move lower. The higher strike will have a greater sensitivity to implied volatility.

If the option is about to expire, you can *roll forward.* The selection of which option to roll forward into will be related to your market outlook. You might not want to liquidate your existing put if the time premium is falling rapidly and if there is little chance for the option to go in-the-money. In this circumstance, you may want to take a larger risk and sell options on the next expiration while still holding the nearby options. The reward is that you capture the time premium on the nearby contract while holding your longer term position in the farther contract. The risk is that the market will plunge sharply, and you will lose money on both the nearby and the farther options simultaneously.

In any case, rolling forward will cause the position to be much more sensitive to vega. Once again, you should be bearish on implied volatility and be looking for it to be lower in the future.

If the Price of the Underlying Instrument Drops

If the UI price drops and you look for it to continue to drop, liquidation of the position makes the most sense.

Another plan, if you have turned bearish, is to *sell* the *UI* (if it is possible to short the UI). You will have converted the short put into a covered put write. The critical question is whether to sell the UI in the same quantity as the short put or in a delta-neutral quantity. Using the same quantity is more bearish than placing positions in a delta-neutral quantity (see Chapter 13 and Chapter 14 for more details).

However, the problem with this strategy is that it is likely that the profit potential is not particularly high. After all, the put has gone up in value because the UI price has dropped. The put might be in-the-money now. It is even possible that initiating a covered put write might actually lock in a loss. This strategy must be examined closely before entry.

If you think the slump is temporary, you could continue to *hold your current position* or *roll down.* Holding the current position is more aggressive than rolling down. The higher strike will have more risk and reward than the lower strike. Rolling up will also make the position more sensitive to changes in vega, so you should preferably be looking for implied volatility to decline.

If the option is about to expire and you are still bullish, you can *roll forward.* The selection of which strike to sell will follow the guidelines outlined in the Selection section. One decision you will need to make is whether to liquidate the current position and the attendant sharp decay in time premium or to sell the far options and hang on to the current position. The question comes down to your market outlook. Will the price drop more than the time decay? If so, then roll forward. If not, hang on to the current position and sell the next expiration option. Furthermore, rolling forward will increase the sensitivity to implied volatility. An option that is about to expire has little vega, whereas a longer dated option will likely have a significant vega. Thus, you will want to have an opinion on vega before rolling forward.

CHAPTER 13

Covered Put Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Covered Put Writing	Bearish	Decreasing Helps	Helps	Hurts	Limited	Unlimited

STRATEGY

Covered put writing is being short an underlying instrument (UI) and short a put on that instrument.

The following chart shows the various puts available and the instruments against which the put could be written.

Stock Indexes	Futures
Short futures contract	Cash instrument/commodity Futures contract Put with higher strike price and same expiration

Theoretically, you could do a covered put writing program on short stocks. However, it is harder to short stocks, particularly listed stocks, and

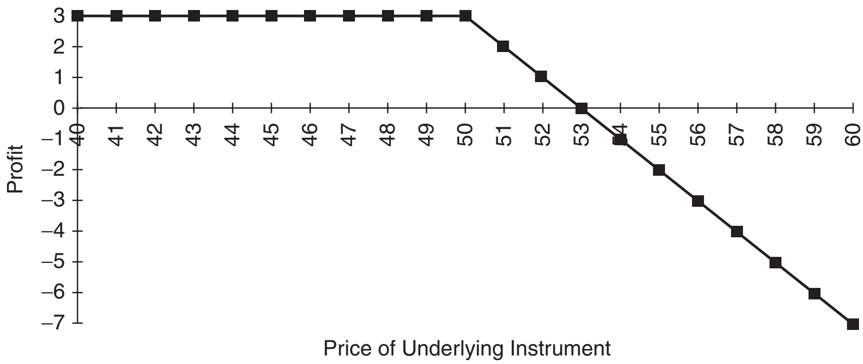


FIGURE 13.1 Covered Put Write

so there tend to be few covered put writing programs on stocks. (*Bear put spread* is the name for writing a put against another put with a higher strike price. See details concerning bear put spreads in Chapter 16.)

The quantity represented by the number of puts sold is equal to the quantity of the UI. For example, covered put writing using options on gold will have one short put option for every short contract. (*Ratio put writing* is the strategy of using differing quantities of the UI and put options. See Chapter 14 for more details.) Figure 13.1 shows the option chart for a covered put write.

There are three main reasons behind covered put writing:

1. To partially hedge existing position against price increases.
2. To increase return on existing short position.
3. To furnish opportunity for profit.

EQUIVALENT STRATEGY

The *naked call write* can be substituted in many cases for a covered put write, particularly with instruments that pay dividends or interest. There are several main considerations for deciding whether to naked call write or covered put write. The first is the commission structure: Commissions will be significantly higher for covered put writes than for naked call writes. The second consideration is the total return from the investment: A covered put write on stocks or debt instruments is responsible for dividend or interest payments that can cut the return even further. The third consideration is that you may already be short the UI so that covered writing may be the only practical action. The alternative would be to buy back the UI and initiate a naked call write. It may be cheaper in commissions to simply sell the puts against the instrument than to liquidate and start a new position from scratch.

RISK/REWARD

Maximum Profit Potential

The maximum profit potential is equal to the UI price minus the strike price of the option plus the price of the put.

$$\text{Maximum profit potential} = \text{UI price} - \text{strike price} + \text{put price}$$

Look at an example of the maximum profit potential. You sell short one contract of Widget bond futures at 90.00 with the strike price of the option at 91.00 and the option premium at 2.00. Your maximum profit potential is $90.00 - 91.00 + 2.00$, or 1.00.

Because puts can be written against a variety of UIs, the transaction costs and carrying costs will vary. For example, a covered put program for stock indexes can theoretically have puts written against a portfolio of stocks, against a long put with a higher strike price, or against a portfolio of convertible securities that relate to the stock portfolio underlying the stock index option.

Break-Even Point and Up-Side Protection

Covered put writing partially hedges both up and down price moves. Figure 13.2 shows the profit/loss diagram for a covered put at expiration. The short put limits the profit potential of the short UI, but buffers the short position from losses by the amount of the premium only.

Losses might be reduced but not limited. Losses are reduced because you receive the put premium, which buffers you from the full value of a price increase. Covered puts show significant losses as the UI rallies above the break-even point. The maximum theoretical risk is unlimited because the UI price has no theoretical cap.

On the other hand, covered put writing has limited profit potential. Figure 13.2 shows how the total profit is limited when the UI price falls below the maximum gain level. At that point, gains in the UI are matched dollar for dollar with the losses in the short put at expiration.

The break-even point is critical for evaluating potential investments. The break-even point shows the amount of up-side protection that the

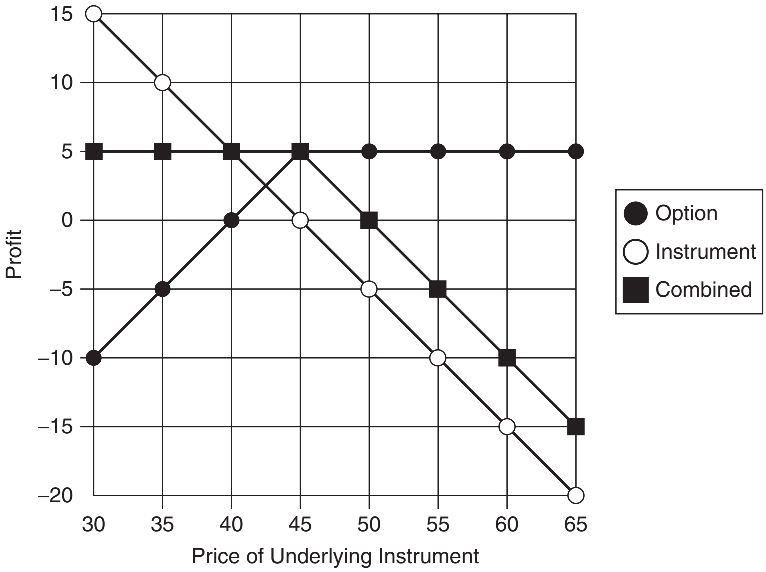


FIGURE 13.2 Covered Put Write

covered put position provides. One advantage of covered put writing is that it is possible to increase the break-even point to above the initial entry level.

The formula for the break-even point is:

$$\text{Break-even point} = \text{UI price} + \text{put premium}$$

For example, use the assumptions of a Treasury-bond futures price of 90.00 and a put premium of 2.00. The break-even point is 90.00 + 2.00, or 92.00. Figure 13.3 shows the break-even point for this example. Note that you sold the futures at 90.00, but you will not lose money unless it is above 92.00 at the expiration of the option. For example, suppose the futures contract is at 91.00 at expiration. This means that the put options will be worth zero, but you will have the 2.00 that you received when you sold the option for a net profit on the option of 2.00. However, you will have a loss on the futures contract of 1.00, the difference between the current value of the futures contract and the selling price. This net is the two-point profit from the sale of the option minus the one-point loss on the purchase of the bond futures, for a total profit of one point.

You can lose money before the expiration of the contract if the price of the UI increases. For example, suppose the bond futures went to 92.00 the first day after initiating a covered put position. The value of the put will have dropped below its initial 2.00 price but not enough to offset the loss in

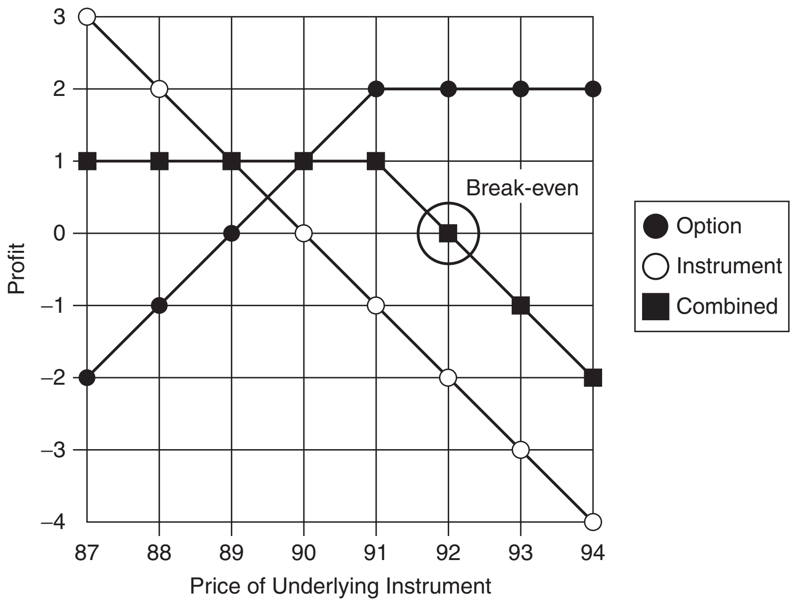


FIGURE 13.3 Covered Put Write

the futures contract because the delta is less than 1.00. This occurs because the value of the put is composed mainly of time value rather than intrinsic value. The decline will be greater if the option is in-the-money because it will have more intrinsic value.

The break-even point as outlined describes the situation only at the expiration of the option. Before then, the break-even point changes with time. The break-even point on the first day in the trade is the entry level. Over time, the break-even point will move above the entry level. The time value of the put decays, creating the profits that raise the break-even point. This shows that a covered put program can stack the odds in your favor.

The break-even point is affected by the type of account and transaction. The trade can take place using cash or on margin.

The up-side protection, specified by the break-even point, is affected by the strike price of the put. A covered put using a higher strike price write will have greater up-side protection than using a lower strike price. The greater premium income provides greater up-side protection.

Net Investment Required

The investment required depends on the instrument. You should check with the appropriate exchange or with your broker for the current requirements. But here are some general guidelines.

For stocks, you will need the collateral to carry a short position, but you will receive the option premium. The investment for a covered write in futures is the premium of the option (marked to the market) plus the greater of either the underlying futures margin minus one-half of the amount that the option is in-the-money or one-half the amount of the underlying futures margin.

Remember that being short stock means that you are liable for dividends and that your investment will increase if you are holding the position during a dividend payment. The same is true for being short cash bonds. Your investment will increase if there is a coupon payment.

The Investment Return

There are two major ways to calculate the return on your investment. Each one presents a different perspective on the proposed trade. Both should be examined before initiating a position.

Return-if-Exercised

The return-if-exercised is the return on the investment if the short UI is called away. The return-to-exercise depends on the type of option and the price action after trade entry. An out-of-the-money option must have the UI price drop to below the strike price or there is no return-if-exercised. This is because the option will not be exercised if it is out-of-the-money and, thus, no return-if-exercised. An in-the-money covered write only requires the UI price to remain unchanged. You will receive the return-if-exercised for an in-the-money covered write even if the UI price is unchanged. The return-if-exercised is the same as the return-if-unchanged (see next section) for an in-the-money write. Remember that the deeper the option is in-the-money, the higher the probability that the return-if-exercised will actually be attained. Comparing the relative merits of different strike prices used in covered writes requires an assumption about the direction of prices.

For example, look at an out-of-the-money covered write. Assume you are selling an April 65 Widget put at \$4, against your short futures position initiated at \$68. Assume that the net investment is \$2,400 and that each \$1 move in the futures contract is worth \$100. If the option is exercised, you will make \$3 on the short sale of the futures ($68 - 65 = 3$), plus \$4 on the sale of the put. The total return will be \$7, worth \$700, on the investment of \$2,400. The return-if-exercised in this example is 29 percent ($700 \div 2{,}400 =$ 29 percent).

You should also look at the annualized return for better comparison with other investments. Suppose you held the Widget covered put position for three months. Your annualized return would be 117 percent (29 percent return for 3 months is equivalent to 117 percent return for 1 year).

Return-if-Unchanged The return-if-unchanged is the return on your investment if there is no change in the UI price from the date of entry to expiration. This method of calculating return has a major advantage over the return-if-exercised; it makes no assumption about future prices. It gives a closer approximation of the return you should expect, assuming a large number of trades. The return-if-unchanged is the same as the return-if-exercised for an in-the-money write.

ORDERS

It is usually best to enter covered put writes as a contingency order, sometimes called a net covered writing order. A *contingency order* instructs the broker to simultaneously execute the sale of the UI and the sale of the put at a net price. Use these orders for both entering and exiting covered writes. Some brokers may have a minimum order size for accepting these orders.

Order entry is important because almost all options are traded on an exchange different from where the UI is traded. The only major exception is options on futures, where the option is traded in the pit next to the instrument. For example, cattle options are traded just a few feet away from the cattle futures pit; but IBM stock is traded around the world, but not at the CBOE, where the option is traded.

The separation of the options exchange and the exchange where the UI is sold makes it more expensive and awkward to execute orders. The brokerage house will not guarantee that the contingency, or net covered call write, orders will be filled. They will try to fill the order at the market bids and asks. The broker may even try to leg into the trade. However, the broker will not fill the order if the risk of loss is too high.

Unfortunately, you may sometimes have to use orders other than contingency orders. This mainly occurs when the UI and the option trade on different exchanges.

The alternative to the contingency order is the *market order*, which guarantees a fill but does not guarantee that the prices will be acceptable. Your expected returns may be significantly altered. You are looking for a particular return when writing calls. Any return less than expected might induce you to discard the trade. This means you should always use contingency orders even if you cannot initiate a position. At least you will get the expected price and return.

The use of the contingency order has one wrinkle. The order is placed by giving the net price of the covered put. For example, you may see a good opportunity by doing a covered put write on 100 shares of General Widget. The stock is currently trading at $62, and the put is at $4. The net price you want is $62 + $4, or $66. Although unlikely, the net order could be filled at $65 and $1 or at $59 and $7. Your analysis has been predicated on getting $62 and $4. In most cases, you will get a quote on the covered write, and your order will be filled close enough to that quote so it does not substantially change the outcome of the trade. In a fast-moving market, however, the fill on the order could change the risk and return of the trade. A fill at $65 and $1 gives very little up-side protection but more profit potential, whereas the fill at $59 and $7 gives greater protection but less potential. In addition, the return-if-exercised remains stable, but the return-if-unchanged and the break-even point have changed dramatically.

WRITING AGAINST INSTRUMENT ALREADY OWNED

Covered put writing profits are relatively small, and the costs of trading need to be carefully monitored. Writing puts against your existing portfolio might increase the yield of covered call writing because you have already paid the commission to enter the UI. You do not have to pay a commission to short the UI. This can have a large percentage impact on your return. Be sure to compare the returns of various writes after taking into account the commission savings of using a UI you already own. The returns of selling against what you already are short will often be greater than starting a trade from scratch because of the commission savings. Clearly, there are few people who have a portfolio of short positions to write puts against.

PHYSICAL LOCATION OF UNDERLYING INSTRUMENT

The physical location of the UI affects the net investment required. In the preceding examples, it was assumed the UI was on deposit with the same broker selling your puts. Each type of UI has different rules determining the margin for a position, and the rules are affected by the physical location of the UI. Please check with the relevant exchange or your broker.

DECISION STRUCTURE

The decision structure for a covered put program has the usual strategy and two follow-up strategies. However, the selection of a covered put is dependent on the reason behind the trade. Each reason has a unique selection structure. There is one factor that affects all three strategies.

A change in implied volatility will affect the price of the written put. Your preference should be to write options that have a high implied volatility, if you expect declining volatility. The worst circumstance would be to write a put with low implied volatility with the expectation of increasing volatility.

At the same time, you might want to consider selling options with high time decay. These will have the quickest profits.

What Is Your Strategy?

The three main reasons behind covered put writing are:

1. To partially hedge existing position against price decline.
2. To increase return on existing short position.
3. To furnish opportunity for profit.

Hedge Existing Position

The first strategy is to write a put against a UI that you think is going to drop in price near-term but will move higher long-term. The idea is that the option premium will protect you against the price rise without having to post any additional funds. In addition, you might make a little money on the decay of the time value. However, remember that selling a put might mean that you will have to give up your short position if the put is exercised. You might have protected a position you will no longer have. In fact, the short put will protect the UI price against a small price rise, but the strategy falls apart if the market drops. You will have your instrument called away if the put is exercised. You wanted to carry the instrument until a particular time, but the market took it away early. To partially protect against this, use an option that does not expire until after you want to liquidate the short put. Look at other hedge strategies, such as buying calls (see Chapter 7).

This strategy implies the sale of an in-the-money put to provide protection. The amount of protection will be determined largely by the delta of the option selected. The only way to protect against the whole expected price rise would be to select the quantity of the in-the-money put that has a delta that will cover the expected price rise. Remember, very in-the-money puts often have poor liquidity, and entering and exiting the short put may be difficult.

Increase Return

The second strategy is to increase return on an existing position. Where do you think the UI price is going? If you are long-term bullish, get out of the UI and invest in something else. If you are bearish, treat the covered put write as a separate trade, and follow the decision outlined in the next section. When you write a put against an existing position, you are no longer in that existing position. Many investors psychologically cling to the short position and do not realize that the sale of the put means that they have liquidated a short position and simultaneously initiated a covered put write. These are two separate trades with differing risk/reward characteristics and decision structures.

Selling a put is a powerful way to increase returns on a UI for which you have a predetermined buy point. Selling a put at the strike price that corresponds to the buy point increases your returns by the amount of the premium while reducing the risk. Selling a put is essentially prebuying your short instrument. When the instrument rises to your target price, the put buyer may call away your instrument. The critical problem is identifying a valid target purchase price.

It is a problem when you have an objective that is below the lowest strike price or when the premium for the strike price at your target is very low. A premium worth only $50 is not high enough to sell. It is probably a better strategy in this case to sell a strike price close to the current UI price and continually roll down by selling additional puts as the UI price drops to your objective. The selling of additional puts essentially changes this from a covered put to a ratio covered put. It is essential that you roll down for a credit; otherwise, you are not increasing your returns.

Alternately, roll down by buying back the current short put and sell a lower strike price. You will be buying back the original put for a loss and then selling a lower strike. Eventually, you will not have to sell another put because the market is no longer moving lower or because you have reached your target and are willing to have your short UI taken away.

Furnish Opportunity for Profit

The third strategy is to furnish an opportunity for profit. First determine your market attitude. A stable market outlook is the best time to sell puts if premiums are high. If you are bullish on the UI, do not write puts. If you are very bearish on the UI, sell out-of-the-money puts (or wait until later to sell the put). This will give you the greatest profit potential, though you will give up some up-side protection. An alternative strategy for the very bearish is to not sell as many options as UIs. For example, sell three puts against your short 400 shares of United Widget. If risk protection is more important, sell in-the-money puts. You will be cutting your potential return, but you will not have as great a risk of loss as selling out-of-the-money puts. Be careful that you are not cutting your potential return to such a low level that it does not compensate for the risk. Your subjective criterion of risk/profit potential, combined with the range of available in-the-money and out-of-the-money options, allows you to fine tune your covered put program.

Put Writing Considerations

There are at least three statistics you need to consider when covered put writing: break-even point, return-if-exercised, and return-if-unchanged. Annualize the return figures to make them easier to compare with each other and with other covered writes. Comparing annualized returns is useful, but those yields are not engraved in stone. You must evaluate the probability of those returns being achieved. You might find one covered put with an annualized return-if-unchanged of 40 percent and another one of only 20 percent. The second covered write is a better investment if your estimation of the chance of success for the first one is only 30 percent, whereas the chance for the second write is 80 percent.

Another consideration is the down-side protection of the proposed trade. You need to find the right combination of profit potential with risk protection. Filter the universe of potential writes to those that provide the minimum amount of desired protection.

One way to rate these writes is to take the potential profits and divide them by the up-side protection to get an idea of the risk/reward ratio. Then use the implied volatility to estimate the expected price range. You will now have a good idea of the probability of both the profit and loss occurring.

If the Price of the Underlying Instrument Rises

If the UI price rises, there are two choices. The first is to *liquidate the trade*. This is the preferred choice if you are now very bullish and think the UI price will never move back below your break-even point.

The second choice, *rolling up*, can provide additional protection while keeping the possibility of profit should the market move higher. It is called rolling up because, as the UI price moves higher, you buy back the original put and sell a put with a higher strike price. The additional premium provides additional up-side protection, though profit potential becomes more limited. If the UI price continues up and you keep selling puts, you might be locking in a loss. The question then becomes: Is the loss from rolling up bigger than the loss of letting my current position ride? Remember, you are, in effect, initiating a new position, so the criteria for entering a new position apply.

For example, you are short Widget futures at $190 and short a June 200 put at $18. Your up-side protection extends up to $208 (excluding transaction costs and carrying charges). Two weeks later, the government releases its Widget crop report that shows large plantings of Widgets. The price of Widgets rises to $208, while the June 180 put drops to $2 and the 200 call is trading for $15. You have lost two points on your position and have reached the break-even point. The price of Widgets will have to be unchanged until expiration to split even. You have little protection left in your June 180 put, but you can increase protection by selling the June 200 put and buying back the June 180 put.

After this transaction, you have down-side protection to $221 because you sold a net premium of $13 (the price of the June 200 put, $15, minus the price of the June 180 put, $2). The premium collected is added to the original break-even point to derive the new break-even point. You will make 13 points at the current level if the Widget price is unchanged. Rolling up gained additional protection and a chance to make money at the higher level. If you had stayed with the original position, you would have made only the 2 points remaining on the June 180 put.

The problem with rolling up is that you are reducing your profit potential. You have agreed to have your Widget future called away at $200 rather than at $180. You have, in effect, swapped additional protection for reduced profit protection.

The key is when, if ever, to roll down. This is a market-timing decision. Liquidate the trade if you have turned bullish. If you are still bearish, the point to roll up might be at the original break-even point, at a technical-resistance point, or at a money-management point.

The real problem arises when the price rises quickly, you do not respond quickly enough, and the market presents you with only an opportunity to roll up and lock in a loss. This is more likely with out-of-the-money writes because they provide less up-side protection. The choice might simply be to lock in a small loss rather than carry the risk of a much larger loss. Be alert to negative price moves, and have a rolling-up plan firmly in place before initiating the original write.

There are three other ways to roll up.

1. Roll up part of your position and keep part in the original call. This increases your up-side protection but gives higher profit potential than rolling up the entire position. This position will increase your

sensitivity to implied volatility, so you should be neutral to bearish on vega before rolling up.

2. Keep the original write, and write another put at the higher strike price. This becomes, in effect, a ratio write with two strike prices. You will be short two puts against one short UI. (See Chapter 14 for more details on the strategic implications and the risk/reward characteristics.) Once again, the new position will be more sensitive to changes in implied volatility.
3. Roll up and forward. In other words, buy back your original put and sell a put at a higher strike price in the next expiration month. This has the advantage/disadvantage of giving more time for your trade to work/backfire. One possibility is to partially roll up and forward—keep some of your original write and roll up and forward some into the next expiration month. Note that rolling up and forward restricts the maximum profit potential for a longer period of time. Rolling forward tends to significantly increase the sensitivity to changes in implied volatility.

If the Price of the Underlying Instrument Drops

If the UI price drops, the first choice is to liquidate the trade and take the profit you had planned. This is particularly attractive if the return comes quickly. There are two other possibilities:

1. Let the instrument get called away; or
2. Roll down.

In the first possibility, the UI will likely be *called away* from you if its price drops below the strike price. This is simply another way of liquidating the trade. When the put is exercised, you will have disposed of the put and the UI at the same time (unless you decide to hold the short UI and short another UI to deliver). You will receive the return-if-exercised on the trade.

In many cases, it is better to roll forward rather than have the UI called away. You will be saving commissions and, as was pointed out earlier, this can increase the return significantly. You will certainly want to roll forward if there is not much time premium left and if you are still bearish or neutral.

The other alternative is to *roll down*. This means writing more puts at lower strike prices as the UI price drops, while buying back the original short put. The key is market timing. You should keep writing puts as the market moves lower, but not to the point where the price begins to rise.

Rolling down increases the maximum profit potential at the expense of the break-even point. Whereas rolling up is a debit transaction and you pay cash, rolling down is a credit transaction. You will receive additional cash.

The break-even point is raised by the amount of the debit. However, you could combine the rolling down with rolling forward to the next expiration month as a potential tactic to reduce the debit.

If the Option Is About to Expire

You are faced with several decisions if your puts are about to expire. The time premium will have essentially vanished. There is no desirability to holding a short put if the time premium is gone. You should either liquidate the trade or roll forward and/or down. The decision is largely based on your market expectation. If your covered put position is *profitable*, you need to ask if your attitude on the market is bullish or bearish.

1. If you are bearish, roll forward into the next expiring option month if the premium levels are attractive. You are, in effect, initiating a new position, so the criteria for entering a new position apply. For example, you need to decide if an in-the-money or out-of-the-money put is appropriate.

   A criterion for determining if you should roll forward is the return per day. However, it is only applicable for rolling forward into the same strike price. For example, you might be able to make $435 for the 23 days left on your current write, but $1,919 on a write on the next expiration month that expires in 83 days. Your return per day on the current write is 435 ÷ 23, or $18.91, whereas the write on the next expiration month returns 1,919 ÷ 83, or $23.12.
2. If you are bullish, you should probably liquidate the trade. It is rarely wise to carry a covered put when you are bullish unless you are expecting a slight and temporary rally in the market. You can always write another put on the next expiration cycle when the rally is over.

If the option is about to expire and your total position is *unprofitable*, you have a couple of alternatives: (1) liquidate the trade unless you see an imminent market turnaround or, (2) if you are still bearish, you could roll forward and up.

DIVERSIFICATION OF PROFIT AND PROTECTION

The goal of your covered put writing is to find covered puts that provide the right combination of profit potential and risk protection. The problem is that the maximum profit potential comes from writing out-of-the-money puts, whereas the maximum protection comes from writing in-the-money puts. Another problem with writing only one type of option is that you are committed to just one strategy, and the potential for the strategy to fail is relatively high. However, you can diversify your portfolio of covered puts by using multiple strike prices. A combination of in-the-money and out-of-the-money options might provide a better balance of profit potential and risk protection. There will be a greater chance of achieving the expected results because you have diversified the potential risks and rewards across a broader array of strike prices.

Another way to increase the chances of achieving your expected return is to diversify through time. You can write puts at the same strike price in different expiration months. For example, you could write the April and July Amalgamated Widget 85 puts.

Combining these two techniques adds another dimension to your strategy. You can fine tune the write program according to your expectations of future prices. For example, you might think that Widget and Associates will be $25 by April and $15 by July. You could write two out-of-the-money puts: an April 25 and a July 15. Alternately, you could write an in-the-money put at the nearest expiration to provide protection now but write an out-of-the-money put in the next expiration month to provide greater profit potential.

CHAPTER 14

Ratio Covered Put Writing

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Ratio Covered Put Writing	NA	NA	Helps	Hurts	Limited	Unlimited

STRATEGY

Ratio covered put writing is being short an underlying instrument (UI), and short more puts on that UI than you have of that UI. For instance, you could be short one S&P 500 futures contract and short two puts. The UI could either be the actual UI or a proxy for that UI, such as another call or a convertible bond. Figure 14.1 shows the option chart for a ratio covered put write.

The first, and main, reason for a ratio covered put write is to capture the time premium of the short puts. This is usually accomplished by selling the UI and selling enough puts to create a delta-neuural position—the sum of the deltas of the short puts will be equal to the delta of the short UI. For instance, you sell one S&P 500 futures contract at 225 and sell two 225 put options with deltas of −0.50 each. The delta on the short stock index futures is −1.00 so you need to sell options that have a total delta of −1.00. In this case, you needed to sell two puts because their deltas were −0.50. (Remember that selling puts makes their deltas positive.)

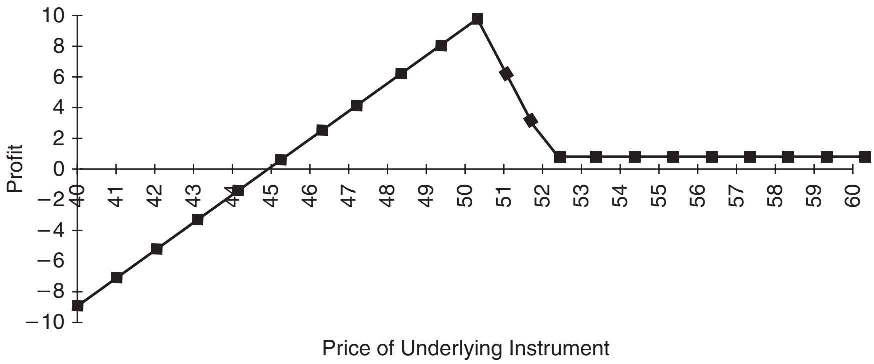


FIGURE 14.1 Ratio Covered Put Write

Note that you have initiated a position that has a delta of zero. This means that you have no market exposure. This shows that a delta-neutral ratio covered put write is a neutral strategy. You do not care if the market goes up or down, at least initially. Some people think this means that they do not have any market risk when, in fact, they do. The option deltas change as the price changes (see Chapter 3 and Chapter 4 for more details). This means that the position acquires a market risk as the UI price changes. (The ramifications of this are highlighted later under Decision Structure.)

Please note that this strategy is particularly suited for investors with extensive holdings. As will become apparent later (under Decision Structure), the larger the position, the better the trade will work. Ratio covered put writing is not attractive for investors who can only afford a few contracts.

The second reason for doing a ratio covered write is to capitalize on a skew in volatility. There are often times when the implied volatility of out-of-the-money options is greater than the at-the-money options. You can sell the out-of-the-money options and buy the at-the-money options, expecting the volatility skew to go away or to be reduced.

For example, assume that the Medical Widgets 100 puts have an implied volatility of 23, the 90 puts are at 26, and the 80 puts are at 30. In this case, you would want to "buy" the 100 put volatility of 23 and "sell" the 80 put volatility of 30, looking for the spread to narrow. In other words, you believe that the difference between the implied volatility of the 100 put at 23 and the implied volatility of the 80 put at 30 will narrow. In this case, you can structure a ratio between the 100 and 80 puts such that the position is vega neutral, that is, the sensitivity of the two positions to changes in implied volatility is neutral. You can then use the UI to make the position delta neutral. This strategy is particularly used when you are neutral on the absolute level of implied volatility.

The third major reason for doing a ratio covered write is to trade implied volatility. This is done using a delta-neutral position. The most popular strategy for trading implied volatility is to use straddles, but ratio writing is also very popular. The ratio write is most often done when the strategist believes that implied volatility is too high. In this case, the position is constructed as a delta-neutral strategy that is net short vega.

EQUIVALENT STRATEGY

There is no equivalent strategy.

RISK/REWARD

The risk/reward of a ratio covered put writing program is more complex than nearly all other option strategies because it is expected to be a dynamic program. The risk/reward parameters outlined here apply only to the initial position and change as the UI price and the composition of the position change. For example, losses should be sharply limited on a theoretically perfect ratio covered put writing program that is being dynamically managed, yet there are discussions of risk and break-even points included.

Another critical point is that the risk/reward of ratio writes are highly dependent on changes in implied volatility before expiration. Gamma and theta tend also to be very high in ratio writes and to have a big impact on profitability before expiration, particularly just before expiration.

Investment

The investment will be the same as a covered put write and the sum of the margin requirements of the naked short puts. For example, if you short one UI and two puts, you have, for margin purposes, one covered put write and one naked short put.

Break-Even Point

The formulas for the two break-evens for a ratio covered put write are:

$$\text{Down-side break-even} = \text{Strike price} - (\text{maximum profit} \div [\text{number of puts written} - \text{number of UIs sold}])$$

$$\text{Up-side break-even} = \text{Strike price} + (\text{maximum profit} \div \text{number of UIs sold})$$

For stocks, the number of UIs is the number of round lots that were sold. If you were short 250 shares of stock, you would insert 2.5 in the formula.

Maximum Risk

The maximum risk of a ratio covered put write is unlimited. You will lose a point for every point the UI rises when its price climbs below the down-side break-even *for each put you are short in excess of the number of short UIs*. For example, you will lose two points for every point the UI goes below the down-side break-even point if you are short three puts and short one UI. Clearly, the higher the ratio, the higher the risk. The good news is that the UI price cannot go below zero.

On the up-side, the risk is usually very low, if not nonexistant. Quite often, ratio writes are initiated with a credit, particularly when written against another put. This means that there is no up-side risk for most prices. If it is not a credit spread, then the risk is usually very low.

DECISION STRUCTURE

The decision structure of ratio covered put writing is like trying to hit a moving target because of its dynamic nature. The following comments identify the major considerations when making decisions.

Selection

A ratio covered put writing program is largely a method to capture the time premium of options. This usually means that the best option to sell is the at-the-money option because it typically has the most time premium. You will usually be writing two puts for every short UI.

The problem with the at-the-money put is that it is harder to fine tune your position when you are carrying only a small position. (This will be discussed in greater detail in the sections on follow-up strategies.) The point to remember is that you will need more out-of-the-money options to create a delta-neutral position than in-the-money or at-the-money options. The additional options make it easier to adjust your position after entering the trade. This is not a problem when you are carrying hundreds of options contracts, but it does present a problem when you are carrying a small position of just a few options contracts.

A change in implied volatility will affect the price of the position, particularly of the written puts. Your preference should be to write options that have a high implied volatility when you expect declining volatility. The worst circumstance would be to write a put with low implied volatility with the expectation of increasing volatility.

When using a ratio write to capitalize on a volatility skew, make sure that there is a history of the skew coming back into line and that the narrowing will create enough profit to cover your transaction costs and reward you for the risk in the position.

If the Price of the Underlying Instrument Changes Significantly

If the UI price changes, try to keep the position as delta neutral as possible throughout the life of the trade. This will theoretically eliminate price risk as a consideration. In addition, it should maximize the amount of time premium that is captured. The trick is to keep the trade delta neutral. The problem is that the deltas of the options change as the UI price changes. If the UI price climbs, the delta of the options increases, thus making you increasingly short. A declining UI price will make your position increasingly long. You, therefore, must continually change the number of options you are short.

For example, you are short 100 contracts of the S&P 500 futures contract at 550 and short 200 contracts of the S&P 500 put options with a strike of 550 and a delta of 0.50. If the price of the S&P 500 drops to 540, the delta of the options will climb to, say, 0.55. Thus, you will be the equivalent of long 10 contracts of the futures. This can be found by multiplying the number of options (200) by the delta (0.55) and subtracting from that result the delta of the futures (always 1.00) times the number of futures (100); that is, $(0.55 \times 200) - (1.00 \times 100) = +10$. You will now be exposed to risk if the market continues lower.

You, therefore, must adjust the number of contracts you are using to reduce to zero the net delta of the position. To find the new quantity of options, divide the net delta of the long side by the new delta. In this example, the net delta of the long side is found by multiplying the delta by the number of futures, that is, 1.00×100, or 100. The new quantity of options is $100 \div 0.55$, or 181.8, which will have to be rounded to 182. You should then liquidate 18 of your short options to bring your portfolio to the proper weighting, 182.

Note that you will have to buy back those 18 contracts if the UI price moves back up to 550. In addition, a further drop in price would require you to buy additional contracts.

It should be clear that ratio covered put writing requires active management. You simply cannot go away for a vacation and expect to still have a delta-neutral position. Note also that the more the UI price moves in one direction, the more the delta is moving against you.

A second adjustment could also be made to the position after the UI price has moved. Remember, the point of the trade is likely to capture time premium. Therefore, you should roll up or down as the UI price moves from the initial strike price to another strike price. For example, if the price of the S&P 500 futures moves from 550 to 560, you should buy back your 550 puts and sell 560 puts. Conversely, if the UI price should drop to a lower strike price, you should roll down out of your current strike price and into the new at-the-money option.

It is possible that you are not running a delta-neutral program. This would mean that you will likely prefer to see a steady market or, if this is a credit spread, a price move to the up-side. Usually, a steady market is where you will make the most money because the written puts will expire worthless.

The biggest problem comes if the UI price starts to drop below the down-side break-even point. You have significant risk at that point because you will be short extra puts that will be in-the-money. You have several choices: You should liquidate the position if you expect the market to continue lower. You will simply be hurt further by hanging on. It is unlikely that any change in the other greeks will cover your losses due to the drop in the UI price.

Another choice is to cover the position and turn it into a covered put write or a bear spread, rather than a ratio put write. This would be done by buying a higher strike put or selling short some of the UI. The idea is that you become net short or delta neutral. At the same time, you will set up the position so that you will no longer be short gamma. This means that you will not be getting longer as the UI price goes lower. This is obviously a good idea if you are now long. Still, you should look at this as a new position and only do it if the position makes sense as a new position. (Review the selection criterion in Chapter 13 or Chapter 16.)

Problems with Ratio Writes

There is one major problem with the ratio covered put writing program: How often should the portfolio be rebalanced? Theoretically, you should rebalance every time there is a price change that implies a change of one contract in the delta of the position. Presumably, you initiated the position with a specific delta in mind, perhaps delta neutral. Changes in the delta, thus, change the original idea of the trade. The trade-off is that continual adjusting might create too many commissions. This will occur if the UI price jumps back and forth in a narrow range. You will be adjusting your portfolio with every drop in the UI price, creating commission expense; yet the UI price will not really break out of its range.

Unfortunately, there is little that can be done about this, except to not adjust the portfolio as often as would be suggested by keeping the trade delta neutral. The risk of this tactic is that the market moves enough in one direction to create a market exposure, and you lose money because of this exposure.

In the final analysis, it is probably better to adjust whenever necessary and pay the extra commissions as the cost of not exposing yourself to market risk. The key to the answer to this question is the cost of your commissions versus the price risk of a change in the delta.

If the Option Is About to Expire

You are faced with several decisions if your puts are about to expire. The time premium will have essentially vanished. There is no desirability to holding a short put if the time premium is gone. You should either liquidate the trade or roll forward. The decision is largely based on the premium levels of the next contract month. If premium levels are high, then you should consider rolling forward. If they are low, you should consider doing a ratio covered put writing program against another instrument. In essence, the decision to roll forward is exactly the same as the decision to initiate a new position.

CHAPTER 15

Bull Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Bull Spreads	Bullish	Increasing Helps	Hurts	Helps	Limited	Limited

STRATEGY

A *bull spread* is a bullish strategy with both limited risk and profit potential. It is not as bullish as buying a call or selling a put, but the risk is generally lower than buying a call and is significantly lower than selling a put. A bull spread is either:

- Long a low strike call and short a high strike call; or
- Long a low strike put and short a high strike put.

This is a popular spread because it usually has a low investment, has limited risk, and compares favorably with other bull strategies. Many investors will take the money they would have invested in long calls and buy bull spreads instead. In many cases, if the market moves only moderately higher, they will end up with greater profit potential than had they bought calls. Figure 15.1 shows an option chart for a bull spread.

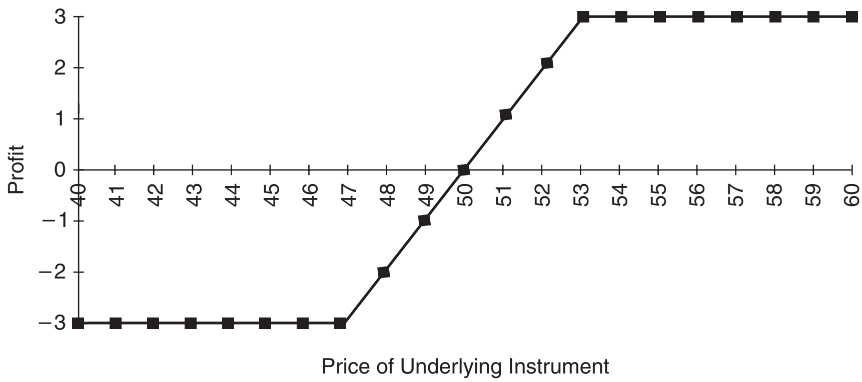


FIGURE 15.1 Bull Spread

Note the caveat of being only moderately bullish. This points to the fact that bull spreads are a strategy if you are moderately bullish, but not if you are very bullish because bull spreads have limited up-side potential. You limit your up-side potential when you buy a bull spread.

Another use of the bull spread is to enhance the profitability of a long call or put. This concept requires that you are already in a long call or put position.

In any long option trade, you might find yourself in either a profitable or an unprofitable situation. If you are holding a profitable long position, you can write a higher strike option to create a bull spread and help protect your profits. In effect, you have limited your profit potential, but you have also limited your risk.

Note that this strategy works for both puts and calls. However, you are bullish on the market if you are in a profitable call position, but bearish if you are in a profitable put position. This means that your market attitude must turn 180 degrees if you are to use this technique for puts. For calls, this strategy is a signal that you are less bullish than before you switched to a bull spread.

RISK/REWARD

Net Investment Required

The net investment is the price of the option with the lower strike price minus the price of the call with the higher strike price. This will always be a debit transaction for a bull call spread because the lower strike call must always be priced lower than the higher strike call. It will always be a credit transaction for bull put spreads because the higher strike puts must always be priced higher than the lower strike puts.

Look at an example: The Major Market Index (MMI) closes at 650.30, the November 645 call is priced at $10^3/_4$, and the November 650 call is priced at $7^7/_8$. Your net investment will be a debit of the difference between the costs of the two options. In this case, you will pay $10^3/_4$ minus $7^7/_8$, or $2^7/_8$. At the same time, the November 645 put was trading at 7, and the November 650 was trading at $9^1/_8$. Here, the trade would be initiated at a net credit of $2^1/_8$.

Maximum Return

The maximum return is limited for a bull spread. You will receive the maximum return if the underlying instrument (UI) is trading above the higher of the two strike prices when the options expire.

The maximum profit potential for a *bull call spread* is equal to the higher strike price minus the lower strike price minus the net investment. The maximum profit potential for a *bull put spread* is the net credit received when the trade is initiated.

Assume you initiated the bull put spread of buying the November 645 put at 7 and selling the November 650 put at $9^1/_8$ when the MMI was trading at 650.50. You will receive the maximum profit of $2^1/_8$ if the MMI is still above the higher of the two strike prices, in this case, 650. Table 15.1 shows the profit or loss for each of the two options and the net profit or loss for the total position at different prices of the MMI when it expires.

Another column can be added to this table so you can see the difference between this strategy and the outright purchase of a call. In this case, assume you bought the November 650 call at $7^7/_8$. Table 15.2 shows that

TABLE 15.1 Bull Put Spread Results

	Profit/Loss		
MMI price	**645 put**	**650 put**	**Net profit/loss**
630	+8	$-10^7/_8$	$-2^7/_8$
635	+3	$-5^7/_8$	$-2^7/_8$
640	−2	$-^7/_8$	$-2^7/_8$
645	−7	$+4^1/_8$	$-2^7/_8$
$647^7/_8$	−7	+7	0
650	−7	$+9^1/_8$	$+2^1/_8$
655	−7	$+9^1/_8$	$+2^1/_8$

TABLE 15.2 Bull Put Spread versus Call Purchase

	Profit/Loss			
MMI price	**645 put**	**650 put**	**Net profit/loss**	**Call results**
630	+8	$-10^7/_8$	$-2^7/_8$	$-7^7/_8$
635	+3	$-5^7/_8$	$-2^7/_8$	$-7^7/_8$
640	−2	$-^7/_8$	$-2^7/_8$	$-7^7/_8$
645	−7	$+4^1/_8$	$-2^7/_8$	$-7^7/_8$
$647^7/_8$	−7	+7	0	$-7^7/_8$
650	−7	$+9^1/_8$	$+2^1/_8$	$-7^7/_8$
655	−7	$+9^1/_8$	$+2^1/_8$	$-2^7/_8$

the purchase of the bull spread is superior to the purchase of a call, unless the market climbs significantly. The difference is particularly sharp when viewed on an equal-dollar-invested basis. In this example, you could initiate about three bull spreads for the same investment as one call.

Maximum Risk

The maximum risk is different for bull call and bull put spreads. For a *bull call spread*, the maximum risk will occur when the UI price falls below the lower strike price. For a *bull put spread*, the maximum risk will occur at the point found by taking the difference in strike prices minus the net credit received.

Table 15.1 shows an example of the maximum risk and the point where it occurs, $647^7/_8$. Table 15.3 shows the same situation for a bull call spread with the 645 call purchased for $10^3/_4$ and the 650 call purchased for $7^7/_8$.

The dollar risk for a bull call spread is the net debit paid to initiate the position. The risk for a bull put spread is the difference between

TABLE 15.3 Bull Call Spread Results

	Profit/Loss		
MMI price	**645 call**	**650 call**	**Net profit/loss**
640	$-10^3/_4$	$+7^7/_8$	$-2^7/_8$
645	$-10^3/_4$	$+7^7/_8$	$-2^7/_8$
$647^7/_8$	$-7^7/_8$	$+7^7/_8$	0
650	$-5^3/_4$	$+7^7/_8$	$+2^1/_8$
655	$-^3/_4$	$+2^7/_8$	$+2^1/_8$

the two strike prices minus the net credit received when the trade was initiated.

Tables 15.1 to 15.3 show examples of these calculations. Here are two more examples: Assume you buy a Boeing November 55 call at 2 and sell a November 60 call at $^3/_8$ when the stock is trading at 55. The maximum risk for this trade is the net debit of 2 –$^3/_8$, or 1$^5/_8$. Now look at a bull put spread where you buy the Boeing November 55 put at 1$^5/_8$ and sell the November 60 put at 5$^1/_2$ for a net credit of 3$^7/_8$. Your risk is 60 – 55 – 3$^7/_8$, or 1$^1/_8$.

Break-Even Point

The break-even points for bull call spreads and bull put spreads are slightly different. For bull put spreads, the break-even point is the high strike price minus net credit received. For bull call spreads, it is the low strike price plus net debit paid. In Tables 15.1 and 15.3 the break-even point occurs at 647$^7/_8$.

DECISION STRUCTURE

As mentioned under Strategy, there are two possible uses for the bull spread concept: as a trade and as a profit enhancement tool. Both strategies use the same selection and follow-up strategies.

Selection

Bull spreads can be structured to reflect how bullish you are. You can make them as bullish as your market outlook. The most bullish call spread has both legs out-of-the-money, while the least bullish put spread has both legs out-of-the-money.

One critical question is whether to select the bull put spread or the bull call spread. In general, the risk and reward of the two different styles are very close, though some investors believe that put spreads tend to be slightly more attractive. For example, the ratio of the maximum profit potential to the dollar risk will tend to be slightly higher for bull put spreads than for bull call spreads. In addition, bull put spreads are credit transactions.

These bull-put-spread advantages do not come free. Some disadvantages are:

- Put spreads are liable for early exercise if you are short an in-the-money option. Note that the more bullish you are, the more chance of early exercise. Thus, you might be exercised before having a chance to make the maximum profit.

- Puts tend to be less liquid than calls. As a result, the bid/ask spread may be larger, and you may have more trouble entering or exiting your trade in the quantity you want.
- Time decay is working against the bull put spreader. Time is usually working in favor of the bull call spreader due to the usually greater decline in time premium of the short call than the long call. However, time is working against the bull put spread because the long put's time premium is likely to be decaying faster than the short put's time premium.
- Commissions tend to be a larger percentage of the potential profit than with other option strategies. Be sure to consider the cost of commissions before selecting a bull spread over other bullish strategies and before selecting the strike price.

Bull spreads can be selected by looking at their maximum risk/reward weighted by the chances of occurring, based on the implied volatility or your expected volatility. This is a two-step procedure: (1) List the ratio of maximum profit potential versus the maximum dollar risk of all possible bull spreads, and (2) Weight the results by the chance of occurring as determined by either the implied volatility or by your expected volatility. This will give you an expected return on all the bull spreads for that instrument. Unfortunately, this is a technique that essentially requires a computer to go through the myriad of computations.

Generally speaking, bull spreads are not highly sensitive to implied volatility—you are both long and short volatility because you are both long and short an option. Still, the net result is that you are long vega, so it is best to believe that the outlook for implied volatility is bullish.

If the Price of the Underlying Instrument Drops

Bullish Strategies If the UI price drops and you are still bullish, you could:

1. Hold the existing position;
2. Liquidate one of the options; or
3. Roll down.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. You know what your risk is, and, in fact, you already might have moved to below the point of maximum risk. If this is the case, you have nothing further to lose on this trade.

A more aggressive tactic is to *liquidate either the short call option if you are in a bull call spread or the long put option if you are in a bull put spread.* This changes the character of the trade to either a long call or a short put. The net effect is that you have thrown in the towel on the bull spread and are now taking a more bullish stance on the market. Your rationale might be that the market was only somewhat bullish at higher levels, but it is much more bullish at these lower levels. The problem with this tactic is that it is too easy to rationalize and emotionally make a decision in an effort to "double up and catch up." Many traders, when confronted with a losing position, will take on too much risk in an effort to recapture their losses. The net effect is that there is nothing intrinsically wrong with this tactic, but it must be done rationally.

Look at the bull call spread used in Table 15.3 as an example: Assume the market dipped to 640 the day after you entered the bull spread—the 645 call is now selling for $2^3/_4$, and the 650 is selling at 1. Your choice is either to stick with the bull call spread or to liquidate the short 650 call. Table 15.4 shows the results at different price levels of these two strategies. Remember that shifting to a long call at this point means that you are starting out with a loss of $2^7/_8$. This loss is counted in the results of the long call. Notice that prices must move significantly higher before you will make a profit on the long call.

The alternative is to liquidate the long put. The problem with this is that you have shifted to a position that probably has little time premium in it, and the profits will not be large enough to cover the loss on the original spread. You, therefore, will rarely want to liquidate the long put if you are in a bull put spread, but selling the short call can be a very viable strategy.

The final tactic is to *roll down.* This entails liquidating the existing bull spread and initiating another bull spread using lower strike prices.

TABLE 15.4 Bull Call Spread Results and Long Call Results

Price	Bull spread	Long call
635	$-2^7/_8$	$-5^5/_8$
640	$-2^7/_8$	$-5^5/_8$
645	$-2^7/_8$	$-5^5/_8$
$647^7/_8$	0	$-2^3/_4$
650	$+2^1/_8$	$-^5/_8$
655	$+2^1/_8$	$+4^3/_8$

TABLE 15.5 Bull Call Spread Results and Rolling-Down Results

Price	Original bull spread	New bull spread
635	$-2^7/_8$	$-4^7/_8$
640	$-2^7/_8$	$-4^7/_8$
645	$-2^7/_8$	$-^1/_8$
$647^7/_8$	0	$+^1/_8$
650	$+2^1/_8$	$+^1/_8$
655	$+2^1/_8$	$+^1/_8$

One problem with this tactic is that you are initiating the trade with the loss of the original bull spread. The advantage of rolling down is that you are creating a lower break-even point. Table 15.5 compares the result from holding the original bull spread with the result from rolling down by buying the 640 call at $4^3/_4$ and selling the 645 call at $2^3/_4$. Remember that the result of the new bull spread includes the loss of $2^7/_8$ from liquidating the original spread. The most interesting feature of Table 15.5 is that it shows that you have reduced the profit potential of the new position by the amount you lost on the original spread. This means that you will lock in a loss if you roll down to a new bull spread that has a lower profit potential than the dollar risk on the original spread. As a result, rolling down is usually not the preferable follow-up tactic.

Neutral Strategies

If the UI price drops and you expect prices to remain about the same, you could:

1. Hold the position; or
2. Liquidate the position.

Holding the position is the most common response to this situation. You already know what can happen in terms of risk and reward. You might have already reached the maximum loss point and have nothing more to lose on the trade. If this is the situation, then you might as well hold the position.

On the other hand, *liquidating the position* is viable if you have a small profit in the trade but are now significantly worried about the possibility of a further down-move. You might want to take the profits you have in the trade and run.

Bearish Strategies If the UI price drops and you are bearish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate one of the options.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. You know what your risk is, and, in fact, you might already have moved to below the point of maximum risk. If this is the case, then you have nothing further to lose on this trade.

Liquidating the position makes sense if you have a small profit in the trade but are now significantly worried about the possibility of a further down-move. You may want to take the profits and eliminate the possibility of further loss.

A more aggressive tactic is to *liquidate either the long call option if you are in a bull call spread or the short put option if you are in a bull put spread.* This changes the character of the trade to either a short call or a long put. The net effect is that you have liquidated the bull spread and are now taking a more bearish stance on the market. Your rationale may be that the market was only somewhat bullish at higher levels but has become bearish. This might occur because of new information or because the UI broke a key price-support level. The problem with this tactic is that it is too easy to rationalize and emotionally make a decision in an effort to double up and catch up. Many traders, when confronted with a losing position, will take on too much risk in an effort to recapture their losses. There is nothing intrinsically wrong with this tactic, but it must be done rationally.

Look at the bull call spread used in Table 15.3 as an example. Assume the market dipped to 640 the day after you entered the bull spread—the 645 call is now selling for $2^3/_4$, and the 650 is selling at 1. Your choice is either to stick with the bull call spread or to liquidate the long 645 call. Table 15.6 shows the results at different price levels for these two strategies. Remember that shifting to a short call at this point means that you are starting out with a loss of $2^7/_8$. This loss is counted in the results of the short call. Notice that, in this example, you can never make a profit. The effect of going naked short the call is to reduce your loss on the original bull spread by capturing additional time premium if the UI price continues lower. The only way you can make a profit by liquidating the long call is if the premium on the short call is larger than the loss on the original bull spread.

TABLE 15.6 Bull Call Spread Results and Short Call Results

Price	Bull spread	Short call
640	$-2^7/_8$	$-1^7/_8$
645	$-2^7/_8$	$-1^7/_8$
$647^7/_8$	0	$-1^7/_8$
650	$+2^1/_8$	$-1^7/_8$
655	$+2^1/_8$	−4
660	$+2^1/_8$	−9

Liquidating the short put makes more sense, if you originally put on a bull put spread, because the long put has much greater profit potential than the short call.

Converting a bull call spread into a short call will rarely make sense, but converting it into a long put can often be an attractive tactic if you are now bearish.

If the Price of the Underlying Instrument Rises

Bullish Strategies If the UI price rises and you are still bullish, you could:

1. Hold the existing position;
2. Liquidate one of the options; or
3. Roll up.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. After all, the trade is progressing the way you felt it would. In general, this is the best course to hold if the price of the UI has risen and your basic market stance has not changed.

If you feel the market is no more bullish than when you first entered the spread, you could *liquidate either the short call option if you are in a bull call spread* or the long put option if you are in a bull put spread. This changes the character of the trade to either a long call or a short put. You are now saying that the market is more bullish than you originally thought, and you now want to participate in any further up-side movement. The maximum profit potential might have already been reached on the spread.

Look at the bull call spread used in Table 15.3 as an example. Assume the market rallied to 660 the day after you entered the bull spread—the 645 call is now selling for 20, and the 650 is selling at 17. Your choice is

TABLE 15.7 Bull Call Spread Results and Long Call Results

Price	Bull spread	Long call
645	$-2^7/_8$	$-17^7/_8$
650	$+2^1/_8$	$-12^7/_8$
655	$+2^1/_8$	$-7^7/_8$
660	$+2^1/_8$	$-2^7/_8$
665	$+2^1/_8$	$+2^1/_8$
670	$+2^1/_8$	$+7^1/_8$

between sticking with the bull call spread or liquidating the short 650 call. Table 15.7 shows the results at different price levels for these two strategies. Remember that shifting to a long call at this point means that you are starting out with a locked-in profit of $2^1/_8$, the maximum profit on this particular spread. This is counted in the results of the long call. Notice that prices must move significantly higher before you will make a profit on the long call. In addition, you now have down-side risk because you are long a call that is far in-the-money.

The alternative is to liquidate the long put. The problem with this is that you have shifted to a position that probably has little time premium in it, and the profits will not be large. You, therefore, will rarely want to liquidate the long put if you are in bull put spread, but selling the short call can be a viable strategy.

The final tactic is to *roll up*. This entails liquidating the existing bull spread and initiating another bull spread using higher strike prices. One advantage with this tactic is that you are initiating the trade with the profit of the original bull spread. The disadvantage of rolling up is that you are creating a higher break-even point. Table 15.8 compares holding the original bull spread with rolling up by buying the 650 call at 13 and selling the 655 call at 10. Remember that the result for the new bull spread includes the profit of $2^1/_8$ from liquidating the original spread. The most interesting feature of Table 15.8 is that it shows that you have increased the profit

TABLE 15.8 Bull Call Spread Results and Rolling Up Results

Price	Original bull spread	New bull spread
645	$-2^7/_8$	$-^7/_8$
650	$+2^1/_8$	$-^7/_8$
655	$+2^1/_8$	$+4^1/_8$
660	$+2^1/_8$	$+4^1/_8$
665	$+2^1/_8$	$+4^1/_8$

potential of the new position by the amount you gained on the original spread. You will lock in a profit if you roll up to a new bull spread that has a risk that is less than the profit potential on the original spread. As a result, rolling up is usually an attractive follow-up tactic.

Neutral Strategies If the UI price rises and you expect prices to remain about the same, you could:

1. Hold the position; or
2. Liquidate the position.

Holding the position is the most common response to this situation. You already know what can happen in terms of risk and reward. Unfortunately, you might have already reached the point of maximum profit potential.

On the other hand, *liquidating the position* is a viable tactic if you have reached the point of maximum profit potential. The risk of holding the position is now much higher than the expected reward. You might be better off taking profits now and eliminating your risk.

Bearish Strategies If the UI price rises and you are bearish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate one of the options.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. You know what your risk and profit potential are, and, in fact, you might already have moved above the point of maximum profit potential. The key is whether you think the UI price will carry below the point of maximum return. Holding the position only makes sense if the risk of lower prices will not hurt the profit in the trade. This will occur only if the UI price has moved significantly over the point of maximum profit potential.

Liquidating the position makes sense if you have a profit in the trade but are now significantly worried about the possibility of a further downmove. You might want to take the profits and eliminate the possibility of further loss.

A more aggressive tactic is to *liquidate either the long call option if you are in a bull call spread or the short put option if you are in a bull put spread.* This changes the character of the trade to either a short call

TABLE 15.9 Bull Call Spread Results and Short Call Results

Price	Bull spread	Short call
640	$-2^7/_8$	$-1^7/_8$
645	$-2^7/_8$	$-1^7/_8$
$647^7/_8$	0	$-1^7/_8$
650	$+2^1/_8$	$-1^7/_8$
655	$+2^1/_8$	−4
660	$+2^1/_8$	−9

or a long put. The net effect is that you have liquidated the bull spread and are now taking a more bearish stance on the market. Your rationale might be that the market was only somewhat bullish at higher levels but has become bearish because of new information or because the UI price broke a key price support level.

Look at the bull call spread used in Table 15.3 as an example. Assume the market rallied to 660 the day after you entered the bull spread—the 645 call is now selling for 20, and the 650 is selling at 17. Your choice is between sticking with the bull call spread or liquidating the long 645 call. Table 15.9 shows the results at different price levels for these two strategies. Remember that shifting to a short call at this point means that you are starting out with a loss of $2^7/_8$. This loss is counted in the results of the short call. Notice that, in this example, you can never make a profit. The effect of going naked short the call is to reduce your loss on the original bull spread by capturing additional time premium if the UI price continues lower. The only way you can make a profit by liquidating the long call is if the premium on the short call is larger than the loss on the original bull spread.

Liquidating the short put makes more sense if you originally put on a bull put spread because the long put has much greater profit potential than the short call. The net result is that converting a bull call spread into a short call will rarely make sense, but converting it into a long put can often be an attractive tactic if you are now bearish.

CHAPTER 16

Bear Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Bear Spreads	Bearish	Increasing Helps	Hurts	Helps	Limited	Limited

STRATEGY

A bear spread is a bearish strategy with both limited risk and profit potential. It is not as bearish as buying a put or selling a call, but the risk is generally lower than buying a put and is significantly lower than selling a call. A bear spread is either:

- Long a high-strike call and short a low-strike call; or
- Long a high-strike put and short a low-strike put.

This is a popular spread because it usually has a low investment, has limited risk, and compares favorably with other bear strategies. Many investors will take the money they would have invested in long puts and buy bear spreads instead. In many cases, they will end up with greater profit potential if the market moves only moderately lower. Figure 16.1 shows an option chart for a bear spread.

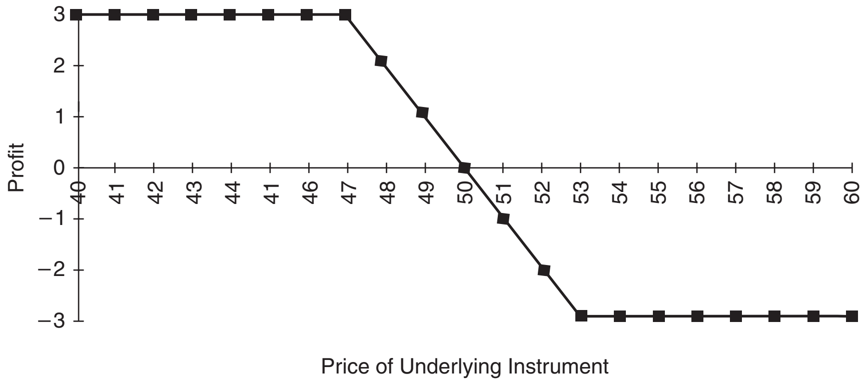


FIGURE 16.1 Bear Spread

Note the caveat of being only moderately bearish. Bear spreads are a good strategy if you are moderately bearish but not if you are very bearish because bear spreads have limited down-side potential. You limit your down-side potential when you buy a bear spread.

Another use of the bear spread is to enhance the profitability of a long call or put. This requires that you are already in a long-call or long-put position.

In any long option trade, you might find yourself in either a profitable or an unprofitable situation. If you are holding a profitable long position, you can write a lower strike option to create a bear spread and help protect your profits. In effect, you have limited your profit potential, but you have also limited your risk.

Note that this strategy works for both puts and calls. However, you will be bullish on the market if you are in a profitable call position, but bearish if you are in a profitable put position. This means that your market attitude must turn 180 degrees if you are to use this technique for calls. For puts, this strategy is a signal that you are less bearish than before you switched to a bear spread.

RISK/REWARD

Net Investment Required

The net investment is the price of the option with the lower strike price minus the price of the call with the higher strike price. This will always be a credit transaction for a bear call spread because the lower strike call must always be priced lower than the higher strike call. It will always be a debit transaction for bear put spreads because the higher strike puts must always be priced higher than the lower strike puts.

Look at an example. The Major Market Index (MMI) closes at 650.30, the November 645 call is priced at $10^3/_4$, and the November 650 call is priced at $7^7/_8$. Your net investment will be a credit of the difference between the costs of the two options. In this case, you will receive $10^3/_4$ minus $7^7/_8$, or $2^7/_8$. At the same time, the November 645 put is trading at 7, and the November 650 is trading at $9^1/_8$. Here, the trade would be initiated at a net debit of $2^1/_8$.

Maximum Return

The maximum return is limited for a bear spread. You will receive the maximum return if the underlying instrument (UI) is trading below the lower of the two strike prices when the options expire.

The maximum profit potential for a *bear put spread* is equal to the higher strike price minus the lower strike price minus the net investment. The maximum profit potential for a *bear call spread* is the net credit received when the trade is initiated.

Assume you initiated the bear put spread by selling the November 645 put at 7 and buying the November 650 put at $9^1/_8$ when the MMI was trading at 350.50. You will receive the maximum profit of $2^7/_8$ if the MMI is below the lower of the two strike prices, in this case, 645. Table 16.1 shows the profit and loss for each of the two options and the net profit or loss for the total position at different prices of the MMI when it expires.

Another column can be added to this table so you can see the difference between this strategy and the outright purchase of a put. In this case, assume you bought the November 650 put at $9^1/_8$. Table 16.2 shows that

TABLE 16.1 Bear Put Spread Results

	Profit/Loss		
MMI price	**645 put**	**650 put**	**Net profit/loss**
630	−8	$+10^7/_8$	$+2^7/_8$
635	−3	$+5^7/_8$	$+2^7/_8$
640	+2	$+^7/_8$	$+2^7/_8$
645	+7	$-4^1/_8$	$+2^7/_8$
$647^7/_8$	+7	−7	0
650	+7	$-9^1/_8$	$-2^1/_8$
655	+7	$-9^1/_8$	$-2^1/_8$

TABLE 16.2 Bear Put Spread versus Put Purchase

	Profit/Loss			
MMI price	**645 put**	**650 put**	**Net profit/loss**	**Put results**
630	−8	+10 7/8	+2 7/8	+10 7/8
635	−3	+5 7/8	+2 7/8	+5 7/8
640	+2	+7/8	+2 7/8	+7/8
645	+7	−4 1/8	+2 7/8	−4 1/8
647 7/8	+7	−7	0	−7
650	+7	−9 1/8	−2 1/8	−9 1/8
655	+7	−9 1/8	−2 1/8	−9 1/8

the purchase of the bear spread is superior to the purchase of a put unless the market drops significantly. The difference is particularly sharp when viewed on an equal-dollar-invested basis. In this example, you could initiate about three bear spreads for less investment than one put.

Maximum Risk

Maximum risk is different for bear call and bear put spreads. For a *bear put spread*, the maximum risk will occur when the UI price moves above the higher strike price. For a *bear call spread*, the maximum risk will occur at the point found by adding the lower strike price to the net credit received. The dollar risk is equal to the difference in strike prices minus the credit received.

Table 16.1 shows an example of the maximum risk and the point where it occurs, 650. Table 16.3 shows the same situation for a bear call spread with the 645 call sold for $10^{3}/_{4}$ and the 650 call purchased for $7^{7}/_{8}$.

TABLE 16.3 Bear Call Spread Results

	Profit/Loss		
MMI price	**645 call**	**650 call**	**Net profit/loss**
640	+10 3/4	−7 7/8	+2 7/8
645	−10 3/4	−7 7/8	+2 7/8
647 7/8	+7 7/8	−7 7/8	0
650	+5 3/4	−7 7/8	−2 1/8
655	+3/4	−2 7/8	−2 1/8

The dollar risk for a bear put spread is the net debit paid to initiate the position. The risk for a bear call spread is the difference between the two strike prices minus the net credit received when the trade was initiated.

Tables 16.1 to 16.3 show examples of these calculations. Here are two more examples. Assume you sell a Boeing November 55 call at 2 and buy a November 60 call at $^3/_8$ when the stock is trading at 55. Your risk is $60 - 55 - 1^5/_8$, or $3^3/_8$. Now look at a bear put spread, where you sell the Boeing November 55 put at $1^5/_8$ and buy the November 60 put at $5^1/_2$. The maximum risk for this trade is the net debit of $5^1/_2 - 1^5/_8$, or $3^7/_8$.

Break-Even Point

The break-even points for bear call spreads and bear put spreads are slightly different. For bear put spreads, the break-even point is the high strike minus net debit paid. For bear call spreads, it is the low strike price plus net credit received. In Tables 16.1 and 16.3, the break-even point occurs at $647^7/_8$.

DECISION STRUCTURE

As mentioned under Strategy, there are two possible uses for the bear spread concept: as a trade and as a profit enhancement tool. Both strategies use the same selection and follow-up strategies.

Selection

Bear spreads can be structured to reflect how bearish you are. You can make them as bearish as your market outlook. The most bearish call spread has both legs in-the-money, while the least bearish put spread has both legs in-the-money.

One critical question is whether to select the bear put spread or the bear call spread. In general, the risk and reward of the two different styles are very close, though some investors believe that call spreads are slightly more attractive. For example, the ratio of the maximum profit potential to the dollar risk will tend to be slightly higher for bear call spreads than for bear put spreads. In addition, bear call spreads are credit transactions.

These bull-call-spread advantages do not come free. Some disadvantages are:

- Call spreads are liable for early exercise if you are short an in-the-money option. The more bearish you are, the more chance of early

exercise. Thus, you might be exercised before having a chance to make the maximum profit.
- Puts tend to be less liquid than calls. As a result, the bid/ask spread might be larger, and you might have more trouble entering or exiting your trade in the quantity you want.
- Time decay is working against the bear call spreader. Time is usually working in favor of the bear call spreader due to the usually greater decline in the time premium of the short call than the long call. However, note that time is working against the bear put spread because the long put's time premium is likely to be decaying faster than the short put's time premium.
- Commissions tend to be a larger percentage of the potential profit than with other option strategies. Be sure to consider the cost of commissions before selecting a bear spread over other bearish strategies and before selecting the strike price.

Bear spreads can be selected by looking at their maximum risk/reward weighted by their chances of occurring, based on the implied volatility or your expected volatility. This is a two-step procedure: (1) list the ratio of maximum profit potential versus the maximum dollar risk of all possible bear spreads; and (2) weight the results by their chances of occurring, as determined by either the implied volatility or your expected volatility. This will give you an expected return on all the bear spreads for that instrument. Unfortunately, this technique requires a computer to go through the myriad of computations.

Generally speaking, bull spreads are not highly sensitive to implied volatility—you are both long and short volatility because you are both long and short an option. Still, the net result is that you are long vega, so it is best to believe that the outlook for implied volatility is bullish.

If the Price of the Underlying Instrument Drops

Bullish Strategies If the UI price drops and you are bullish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate one of the options.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. You know what your risk and profit potential are, and, in fact, you might already have moved above the point of maximum profit potential. The key is whether you think the UI price will carry above the point of maximum return. Holding the position only makes sense if the risk of higher prices will not hurt the profit in the trade. This will occur only if the UI price has moved significantly below the point of maximum profit potential.

Liquidating the position makes sense if you have a profit in the trade but are now significantly worried about the possibility of a further upmove. You might want to take the profits and eliminate the possibility of further loss.

A more aggressive tactic is to *liquidate either the short call option if you are in a bear call spread* or *the long put option if you are in a bear put spread.* This changes the character of the trade to either a short put or a long call. You have liquidated the bear spread and are now taking a more bullish stance on the market. Your rationale might be that the market was only somewhat bearish at lower levels but has become bullish because of new information or because the UI price broke a key price resistance level.

Look at the bear call spread from Table 16.3 as an example, and compare it with the liquidation of the short call: Assume the market dropped to 640 the day after you entered the bear spread—the 645 call is now selling for $2^3/_4$, and the 650 is selling at 1. Your choice is either to stick with the bear call spread or to liquidate the short 645 call. Table 16.4 shows the results at different price levels for these two tactics. Remember that shifting to a long call at this point means that you will have picked up the maximum profit on the bear spread. As a result, you will be starting out with a profit of $2^7/_8$. This profit is included in the results of the long call.

The interesting feature of this tactic is that you might be able to lock in a profit, though it will be lower than the profit you had when you initiated the long call. You still have the potential to gain additional proifts if the market climbs high enough. This feature will occur if the premium on the long call is less than the profit on the bear spread.

The alternative to liquidating the short call is to liquidate the long put, leaving a short put. Although this is riskier, there is usually enough

TABLE 16.4 Bear Call Spread Results and Long Call Results

Price	Bear call spread	Long call
640	$+2^7/_8$	$+1^7/_8$
645	$+2^7/_8$	$+1^7/_8$
650	$-2^1/_8$	$+1^7/_8$
655	$-2^1/_8$	$+6^7/_8$
660	$-2^1/_8$	$+11^7/_8$

premium in the short put to make the trade attractive. Both alternatives should be examined.

Neutral Strategies If the UI price drops and you expect prices to remain about the same, you could:

1. Hold the position; or
2. Liquidate the position.

Holding the position is the most common response to this situation. You already know what can happen in terms of risk and reward. Unfortunately, you might have already reached the point of maximum profit potential.

On the other hand, *liquidating the position* is a viable tactic if you have reached the point of maximum profit potential. The risk of holding the position is now much higher than the expected reward. You might be better off to take profits now and eliminate your risk.

Bearish Strategies If the UI price drops and you are bearish, you could:

1. Hold the existing position;
2. Liquidate the position;
3. Liquidate one of the options; or
4. Roll down.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. After all, the trade is progressing the way you felt it would. In general, this is the best course to hold if the UI price has risen and your basic market stance has not changed.

Liquidating the position makes sense if you have a small profit in the trade, but are now significantly worried about the possibility of a sharp move higher. You might want to take the profits and eliminate the possibility of further loss.

If you feel the market is now more bearish than when you first entered the spread, you could *liquidate either the short put option if you are in a bear put spread* or *the long call option if you are in a bear call spread.* This changes the character of the trade to either a long put or a short call. You are now saying that the market is more bearish than you originally thought, and you now want to participate in further down-side

TABLE 16.5 Bear Put Spread versus Put Purchase

Price	Spread profit/loss	Put result
625	$+2^7/_8$	$+7^7/_8$
630	$+2^7/_8$	$+2^7/_8$
635	$+2^7/_8$	$-2^1/_8$
640	$+2^7/_8$	$-7^1/_8$
645	$+2^7/_8$	$-12^1/_8$
650	$-2^1/_8$	$-17^1/_8$
655	$-2^1/_8$	$-17^1/_8$

movement. The maximum profit potential might have already been reached on the spread.

The bear put spread used in Table 16.1 is an example: Assume that the market dropped to 640 the day after you entered the bear spread—the 645 put is now selling for 17, and the 650 put is selling at 20. Your choice is either to stick with the bear put spread or to liquidate the short 645 put. Table 16.5 shows the results at different price levels for these two tactics. Shifting to a long put at this point means that you are starting out with a locked-in profit of $2^7/_8$, the maximum profit on the original spread. This is counted in the results of the long put. Notice that prices must move significantly lower before you will make a profit on the long put. In addition, you now have significant up-side risk because you are long a put that is far in-the-money.

The alternative is to liquidate the long call. The problem with this is that you have shifted to a position that probably has little time premium in it, and the profits will not be very large. You, therefore, will rarely want to liquidate the long call if you are in a bear call spread, but selling the short put can be a viable strategy.

The final tactic is to *roll down*. This entails liquidating the existing bear spread and initiating another bear spread using lower strike prices. One advantage with this tactic is that you are initiating the trade with the profit of the original bear spread. The disadvantage of rolling down is that you are creating a lower break-even point. Table 16.6 compares holding the original bear call spread shown in Table 16.3 with rolling down by buying the 645 call at $8^3/_4$ and selling the 640 call at $5^3/_4$. Remember that the result for the new bear spread includes the profit of $2^7/_8$ from liquidating the original spread. The most interesting feature of Table 16.6 is that it shows that you have increased the profit potential of the new position by the amount you gained on the original spread. This means that you will lock in a profit if you roll up to a new bull spread that has a risk that is less than the profit potential on the original spread. In this example, you could

TABLE 16.6 Bear Call Spread Results and Rolling-Down Results

Price	Original bear spread	New bear spread
625	$+2^7/_8$	$+5^7/_8$
630	$+2^7/_8$	$+5^7/_8$
635	$+2^7/_8$	$+5^7/_8$
640	$+2^7/_8$	$+4^7/_8$
645	$+2^7/_8$	$-^1/_8$
650	$-2^1/_8$	$-^1/_8$
655	$-2^1/_8$	$-^1/_8$

still lose money, but your risk would be small and you would be increasing the profit potential if you are still bearish.

If the Price of the Underlying Instrument Rises

Bullish Strategies If the UI price rises and you are still bullish; you could:

1. Hold the existing position; or
2. Liquidate the option.

Holding the existing position is the most common tactic. No further computations of break-evens and risks and rewards are necessary. You know what your risk is, and, in fact, you might already have moved to above the point of maximum risk. If this is the case, you have nothing further to lose on this trade.

A more aggressive tactic is to *liquidate either the short call option if you are in a bear call spread or the long put option if you are in a bear put spread.* This changes the character of the trade to either a short put or a long call. The net effect is that you have liquidated the bear spread and are now taking a more bullish stance on the market. Your rationale might be that the market was only somewhat bearish at lower levels but has become bullish. This might occur because of new information or because the UI price broke a key price resistance level. The problem with this tactic is that it is too easy to rationalize and emotionally make a decision in an effort to double up and catch up. Many traders, when confronted with a losing position, will take on too much risk in an effort to recapture their losses. The net effect is that there is nothing intrinsically wrong with this tactic, but it must be done rationally.

TABLE 16.7 Bear Call Spread Results and Long Call Results

Price	Bear call spread	Long call
650	$-2^1/_8$	$-19^1/_8$
655	$-2^1/_8$	$-14^1/_8$
660	$-2^1/_8$	$-9^1/_8$
665	$-2^1/_8$	$-4^1/_8$
670	$-2^1/_8$	$+^7/_8$
675	$-2^1/_8$	$+5^7/_8$

Use the bear call spread from Table 16.3 as an example and compare this with the liquidation of the short call: Assume the market rose to 660 the day after you entered the bear spread—the 645 call is now selling for 20, and the 650 is selling at 17. Your choice is either to stick with the bear call spread or to liquidate the short 645 call. Table 16.7 shows the results at different price levels for these two tactics. Notice that prices must move significantly higher before you will make a profit on the long call.

In addition, you now have significant down-side risk because you are long a call that is far in-the-money.

The alternative to liquidating the short call is to liquidate the long put, leaving a short put. Although this is riskier, there is usually enough premium in the short put to make the trade attractive. Both alternatives should be examined.

Neutral Strategies If the UI price rises and you expect prices to remain about the same, you could:

1. Hold the position; or
2. Liquidate the position.

Holding the position is the most common response to this situation. You already know what can happen in terms of risk and reward. You might have already reached the maximum loss point and have nothing more to lose on the trade. If this is the situation, then you might as well hold the position.

On the other hand, *liquidating the position* is a viable tactic if you have a small loss in the trade but are now significantly worried about the possibility of a further up-move. In effect, you are eliminating the position for a small loss rather than a larger loss.

TABLE 16.8 Bear Put Spread versus Put Purchase

Price	Spread profit/loss	Put result
635	$+2^7/_8$	$+12^7/_8$
640	$+2^7/_8$	$+5^7/_8$
645	$+2^7/_8$	$+^7/_8$
650	$-2^1/_8$	$-4^1/_8$
655	$-2^1/_8$	$-4^1/_8$
660	$-2^1/_8$	$-4^1/_8$

Bearish Strategies If the UI price rises and you are still bearish, you could:

1. Hold the existing position; or
2. Liquidate the option.

Holding the position is the most common response to this situation. You already know what can happen in terms of risk and reward. You might have already reached the maximum loss point and have nothing more to lose on the trade. If this is the situation, then you might as well hold the position.

If you feel the market is still bearish, you could *liquidate either the short put option if you are in a bear put spread* or *the long call option if you are in a bear call spread.* This changes the character of the trade to either a long put or a short call. The net effect is that you have shifted your position from somewhat bearish to very bearish.

The bear put spread used in Table 16.1 is an example: Assume that the market rose to 660 the day after you entered the bear spread—the 645 put is now selling for $5^3/_4$, and the 650 put is selling at 2. Your choice is either to stick with the bear put spread or to liquidate the short 645 put. Table 16.8 shows the results at different price levels for these two tactics. Shifting to a long put at this point means that you are starting out with a loss of $2^1/_8$ on the original spread. This loss is counted in the results of the long put. Note that prices must move significantly lower before you will make a profit on the long put. However, your up-side risk is minimal because the put is out-of-the-money and the premium cost is low.

The alternative is to liquidate the long call. The problem with this is that you have shifted to a position that probably has little time premium in it, and the profits will not be very large. You, therefore, will rarely want to liquidate the long call if you are in bear call spread, but selling the short put can be a viable strategy.

CHAPTER 17

Butterfly Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Butterfly Spreads	Usually Neutral					

STRATEGY

You can initiate both long and short butterfly spreads. Butterfly spreads are usually considered neutral strategies that can be constructed with either puts or calls. However, butterflies can be constructed that have a bullish or bearish bias.

The *long butterfly* is neutral in that it does not look for prices to move very far. A long butterfly is constructed by:

- Buying one low-strike option.
- Selling two medium-strike options.
- Buying one high-strike option.

The *short butterfly* is neutral in that it looks for prices to move significantly in one direction or the other. A short butterfly is constructed by:

- Selling one low-strike option.
- Buying two medium-strike options.
- Selling one high-strike option.

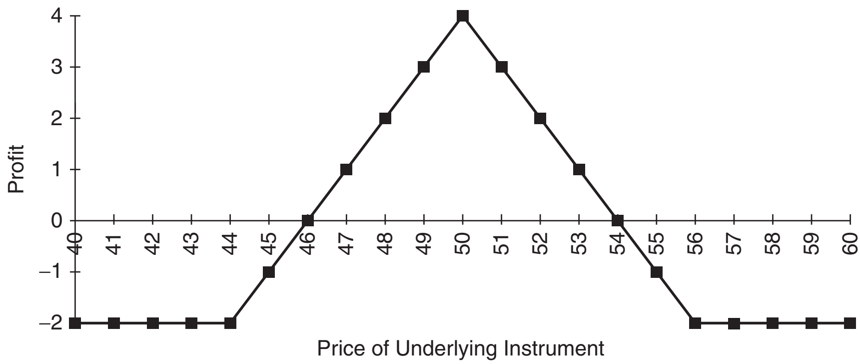


FIGURE 17.1 Long Butterfly

A person putting on a short butterfly does not have to have an opinion on the future direction of the market but does have to expect a move in some direction. (See Figures 17.1 and 17.2 for butterfly option charts.)

A *bullish butterfly* has strike prices such that the middle strike price is above the current market price of the underlying instrument (UI). A *bearish butterfly* has the middle strike below the current market price. The UI price will have to rise or fall toward the middle strike price before the maximum profit potential will be realized. However, there are usually better bull or bear strategies than constructing bull or bear butterflies. As a result, butterflies are nearly always initiated with a neutral market bias.

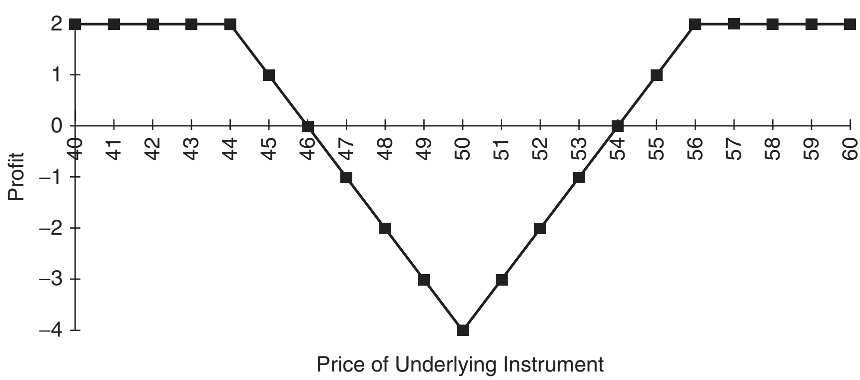


FIGURE 17.2 Short Butterfly

EQUIVALENT STRATEGY

There are two equivalent strategies for the long *butterfly*:

1. Buy a low-strike put, short a medium-strike put, short a medium-strike call, and buy a high-strike call.
2. Buy a low-strike call, short a medium-strike call, short a medium-strike put, and buy a high-strike put.

There are two equivalent strategies for the *short butterfly*:

1. Short a low-strike put, buy a medium-strike put, buy a medium-strike call, and short a high-strike call.
2. Short a low-strike call, buy a medium-strike call, buy a medium-strike put, and short a high-strike put.

Note that the distance between the low and medium strikes and between the medium and high strikes must be equal. It should also be noted that the equivalent strategies are simply combinations of bull and bear spreads. Thus, you can leg into butterflies by initiating appropriate bull or bear spreads.

RISK/REWARD

Break-Even Points

There are two break-evens for each of the butterflies. The following break-even formulas assume that the distances from the middle strike price to the highest and to the lowest strike price are equidistant.

For the long butterfly:

Up-side break-even = Highest strike price − net debit
Down-side break-even = Lowest strike price + net debit

For the short butterfly:

Up-side break-even = Highest strike price − net credit
Down-side break-even = Lowest strike price + net credit

Look at an example of the two break-evens for a long butterfly. Assume that Monsanto is trading at $69^3/_4$, and you want to trade the January options. The 65 strike is trading at $6^1/_4$, the 70 strike is at 4, and the 75 strike last traded at 2. Construct your long butterfly by buying one of the 65 strikes for a debit of $6^1/_4$, selling 2 of the 70 strikes for a credit of 8, and buying one of the 75 strikes for a debit of 2. The net debit on the trade is $-6^1/_4 + 8 - 2$, or $-^1/_4$. The up-side break-even point is the highest strike price, 75, minus the net debit, $^1/_4$, or $74^3/_4$. The downside break-even is the lowest strike price, 65, plus the net debit, $^1/_4$, or $65^1/_4$.

Assume you initiated a short butterfly with the following prices:

Dun & Bradstreet stock = $105^1/_2$

November 100 call = $6^3/_4$

November 105 call = 3

November 110 call = $1^1/_4$

This short butterfly would be initiated for a net credit of $+6^3/_4 - 6 + 1^1/_4$, or 2. The up-side break-even is the highest strike price, \$110, minus the net credit, \$2, or \$108. The down-side break-even is the lowest strike price, \$100, plus the net credit, \$2, or \$102.

Maximum Risk

The *maximum risk for a long butterfly* is the net debit of the spread and occurs outside of the break-even points. The *maximum risk for a short butterfly* is the difference between the middle strike price and one of the outer strike prices (assuming that the middle strike price is equidistant from the outer strike prices) minus the net credit received when the trade is initiated.

For example, you have initiated a short butterfly using the \$45, \$50, and \$55 strike prices and received \$1 in premium. Your maximum risk is the difference between the middle option strike price, \$50, and either of the two outer strikes, \$45, minus the net credit of \$1; that is, \$50 – \$45 – \$1, or \$4.

Profit Potential

The *maximum profit for a long butterfly* is the distance between the middle strike and one of the outer strikes minus the net debit. This assumes equal distance between the three strikes. The maximum profit will be achieved at the middle strike.

The *maximum profit for a short butterfly* is the net credit. This will be achieved at the points represented by the value of the net credit plus the up-side break-even point, or at the down-side break-even point minus the value of the net credit.

Assume a long butterfly of December Telex options with strikes of $50, $55, and $60. The three entry prices are 7, $3^1/_2$, and $1^5/_8$, respectively. The net debit is $1^5/_8$. Thus, the maximum profit potential for this spread is the distance between the middle strike and one of the two outer strikes, 5, minus the net debit, $1^5/_8$; that is, $5 - 1^5/_8$, or $3^3/_8$.

DECISION STRUCTURE

Selection

One key to selecting a butterfly is the cost. The best long butterfly is the cheapest butterfly. The least expensive butterfly will have the lowest dollar risk and the widest range of break-even points. You should try to enter the long butterfly at a premium cost of less than 10 percent of the distance between two of the strike prices. For example, you are interested in buying a butterfly in a stock with strike prices at $50 and $55. This rule of thumb suggests that you should consider purchasing the long butterfly only if you can buy it for less than 0.50. An option evaluation program is useful for identifying possibly underpriced options that can be used to construct a long butterfly.

A second criterion is that you will want to select the outer strike prices to be beyond the expected range of the UI price for the time you will be in the trade. Therefore, you will be selecting those UIs that you expect to be stagnant.

The converse is true with a short butterfly. You are looking for a situation that has overpriced options. The profit potential of the trade is entirely the net price you receive for the option. In addition, you are looking for a situation where the UI price has an excellent chance of moving in either direction. You are looking for a UI that you expect to move beyond the range defined by the two outer strike prices.

Another consideration is volatility. Rising volatility will help a long butterfly but hurt a short butterfly. This is because the volatility will increase the price of the options beyond the initial price, all things being equal.

The final consideration is the selection of the middle strike price. The common practice is to select the at-the-money option as the middle strike price. However, selecting a higher or lower strike price will turn the butterfly into a bull or bear strategy. A higher strike price turns a long butterfly into a bull strategy, whereas a lower strike price will turn it into a bear strategy. A higher strike price turns a short butterfly into a bear strategy, whereas a lower strike price turns the short butterfly into a bull strategy.

Butterflies are very similar to straddles but with much lower risk and reward. In fact, the key advantage of a butterfly over a straddle is that the risk of either a long or a short butterfly is limited, whereas the risk in a short straddle is "unlimited."

If the Price of the Underlying Instrument Drops

The tactics for long and short butterflies are opposite. In general, short butterflies are not popular strategies because of the limited profit potential. Most traders will focus on similar strategies that usually present a better risk/reward ratio, such as long straddles. Also, the follow-up tactics of short butterflies are the flip side of long butterflies. This means that you can simply take the opposite side of the long butterfly tactics. As a result, this section will focus only on the tactics for long butterflies.

Bullish Strategies If the UI price drops and you are bullish, you could:

1. Hold the current position;
2. Convert to bull spread; or
3. Convert to long call(s) or short put(s).

Holding the current position makes sense if the UI price will stay within the limits of the two break-even points. For example, prices might have dropped to below the lower break-even point. Now that you are more bullish, it makes sense to hold the position, looking for it to climb back into the profit zone.

On the other hand, if you are so bullish that you think the price will go above the up-side break-even, you will still want to hold the position and liquidate it when it moves to the middle strike price.

Converting the position into a bull spread is an interesting tactic. It is basically saying that you are no longer neutral on the market but have become bullish. Look at an example of the differences in results using this approach versus leaving the original position untouched. Table 17.1 shows these results. Assume that the trade was initiated with the following prices:

OEX = 530

December 520 call = $15^1/_2$

December 525 call = 13

December 530 call = $10^3/_4$

Net debit of $^1/_4$

TABLE 17.1 Long Butterfly Results and Bull Call Spread Results

Price	Long butterfly	Bull spread
520	$-1/4$	$-2\,3/8$
525	$+4\,3/4$	$+2\,5/8$
530	$-1/4$	$+2\,5/8$

However, the market has dropped to 525, you have switched to the bull camp, and prices are now:

OEX = 525

December 520 call = $9\,7/8$

December 525 call = $7\,1/2$

December 530 call = 5

Notice that you will make more money sticking with the long butterfly if the market stabilizes; but, if the market moves higher, you will make more money on shifting to the bull spread. The drawback to the shift to the bull spread is that you are also giving up the miniscule risk of the long butterfly if the market continues lower.

The final and most bullish alternative is to *convert the position to either a long call or a short put.* This entails liquidating three of the four options in the butterfly. Continuing the example in Table 17.1, Table 17.2 shows the results of keeping the original butterfly spread and moving to the long 520 call at $9\,7/8$.

The net result is that you must have become very bullish to want to shift to a long call over holding the existing butterfly. The risks and the rewards are significantly higher for the long call than for the butterfly.

The alternative to a long call is to hold one of the short puts. This will have less profit potential than the long call, but it has more risk. The main advantage of holding one of the short puts is that you will make money at a

TABLE 17.2 Long Butterfly Results and Long Call Results

Price	Long butterfly	Long call
520	$-1/4$	$-9\,7/8$
525	$+4\,3/4$	$-4\,7/8$
530	$-1/4$	$+1/8$
535	$-1/4$	$+5\,1/8$

lower level compared with the long call. Another advantage is that you are selling time premium rather than buying time premium.

Neutral Strategies If you look for prices to stabilize, you could:

1. Hold the position;
2. Liquidate the position; or
3. Roll down.

Holding the current position makes sense if the UI price will stay within the limits of the two break-even points. For example, prices may have dropped to just above the lower break-even point. It makes sense to hold the position to take the small profit.

Liquidating the position can make sense if prices have dropped to outside the profit zone and if you can limit your losses to something less than the initial risk. Because the risk in long butterflies is usually very low, most investors do not liquidate their existing position, waiting, instead, for the price to rally.

Rolling down entails liquidating the current butterfly and initiating a new position with lower strike prices. You might be taking a loss on the initial position, looking to increase your profit potential if prices stay at their current position. Table 17.3 shows the results for an example.

Bearish Strategies If the UI price drops and you are bearish, you could:

1. Hold the position;
2. Liquidate the position;
3. Convert to bear spread;
4. Convert to short call(s) or long put(s); or
5. Roll down.

TABLE 17.3 Long Butterfly Results and Roll Down Results

Price	Original butterfly	New butterfly
515	$-^1/_4$	+1
520	$-^1/_4$	+6
525	$+4^3/_4$	+1
530	$-^1/_4$	+1

Holding the current position makes sense only if no other tactic looks attractive. In other words, you may want to sit on your small loss rather than take the additional risk of other tactics.

Liquidating the position can make sense if prices have dropped to outside the profit zone and if you can limit your losses to something less than the initial risk. Because the risk in long butterflies is usually very low, most investors do not liquidate their existing position, waiting, instead, for the price to rally.

Converting the position into a bear spread is basically saying that you are no longer neutral on the market, but have become bearish. Look at an example of the differences in results from using the long 530 call/short 525 call bear spread versus leaving the original position untouched. Table 17.4 shows these results at expiration. Assume that the trade was initiated with the following prices with a net debit of $^1/_4$:

OEX = 530

December 520 call = $15^1/_2$

December 525 call = 13

December 530 call = $10^3/_4$

However, the market has dropped to 525, you have switched to the bear side, and prices are now:

OEX = 525

December 520 call = $9^7/_8$

December 525 call = $7^1/_2$

December 530 call = 5

Notice that you will make more money sticking with the long butterfly if the market stabilizes; but, if the market moves lower, you will make more money on shifting to the bear spread. The drawback to the shift to the bear

TABLE 17.4 Long Butterfly Results and Bear Call Spread Results

Price	Long butterfly	Bear spread
515	$-^1/_4$	$+2^3/_8$
520	$-^1/_4$	$+2^3/_8$
525	$+4^3/_4$	$-2^5/_8$
530	$-^1/_4$	$-2^5/_8$

TABLE 17.5 Long Butterfly Results and Short Call Results

Price	Long butterfly	Short call
515	$-1/4$	$+7\,1/2$
520	$-1/4$	$+7\,1/2$
525	$+4\,3/4$	$+7\,1/2$
530	$-1/4$	$+2\,1/2$
535	$-1/4$	$-2\,1/2$
540	$-1/4$	$-7\,1/2$

spread is that you are also giving up the miniscule risk of the long butterfly if the market continues higher.

Converting the position to either a short call or a long put is the most bearish alternative. This entails liquidating three of the four options in the butterfly. Continuing with the example in Table 17.4, Table 17.5 shows the results of keeping the original butterfly spread versus moving to the short 525 call at $7\,1/2$. This shows that shorting the call at the middle strike can be an attractive alternative if you have turned bearish. Note, however, that the short call has greater risk if the market rallies significantly.

The alternative to a short call is to hold a long put if you have initiated a butterfly using puts. This will have greater profit potential than the short call but also more risk. One main problem with converting to the put is that the break-even point is lower than with the short call. Another disadvantage is that you are selling time premium rather than buying time premium.

Rolling down entails liquidating the current butterfly and initiating a new position with lower strike prices. You might be taking a loss on the initial position, looking to increase your profit potential if prices stay at their current position. Table 17.6 shows an example of rolling down so that the middle strike is at-the-money. In this case, you are rolling down to the 515, 520, and 525 strikes with prices of $11\,1/4$, $9\,7/8$, and $7\,1/2$, respectively. A more bearish tactic would be to lower the strike prices even further.

TABLE 17.6 Long Butterfly Results and Roll Down Results

Price	Original butterfly	New butterfly
515	$-1/4$	+1
520	$-1/4$	+6
525	$+4\,3/4$	+1
530	$-1/4$	+1

If the Price of the Underling Instrument Rises

Bullish Strategies If the UI price rises and you are bullish, you could:

1. Liquidate the position;
2. Convert to bull spread;
3. Convert to short put(s) or long call(s); or
4. Roll up.

Liquidating the position can make sense if prices have rallied to outside the profit zone and if you can limit you losses to something less than the initial risk. Because the risk in long butterflies is usually very low, most investors do not liquidate their existing position, waiting, instead, for the price to slump back to the profit zone.

Converting the position into a bull spread is basically saying that you are no longer neutral on the market but have become bullish. Look at an example of the differences in results using this approach versus leaving the original position untouched. Table 17.7 shows these results. Assume that the trade was initiated with the following prices:

OEX = 530

December 520 call = $15^1/_2$

December 525 call = 13

December 530 call = $10^3/_4$

Net debit of $^1/_4$

However, the market has jumped to 535, you have switched to the bull camp, and prices are now:

OEX = 535

December 520 call = $21^1/_8$

December 525 call = $18^1/_2$

December 530 call = $16^1/_2$

TABLE 17.7 Long Butterfly Results and Bull Call Spread Results

Price	Long butterfly	Bull spread
520	$-^1/_4$	$-2^5/_8$
525	$+4^3/_4$	$+2^3/_8$
530	$-^1/_4$	$+2^3/_8$
535	$-^1/_4$	$+2^3/_8$
540	$-^1/_4$	$+2^3/_8$

TABLE 17.8 Long Butterfly Results and Long Call Results

Price	Long butterfly	Long call
515	$-^1/_4$	$-21^1/_8$
520	$-^1/_4$	$-21^1/_8$
525	$+4^3/_4$	$-16^1/_8$
530	$-^1/_4$	$-11^1/_8$
535	$-^1/_4$	$-6^1/_8$
540	$-^1/_4$	$-1^1/_8$
545	$-^1/_4$	$+3^7/_8$

Notice that you will make more money sticking with the long butterfly if the market stabilizes, but you will make more money on shifting to the bull spread if the market moves higher. The drawback to the shift to the bull spread is that you are also giving up the miniscule risk of the long butterfly if the market continues lower.

Converting the position to either a long call or a short put is the most bullish alternative and entails liquidating three of the four options in the butterfly. Continuing with the example in Table 17.7, Table 17.8 shows the results of keeping the original butterfly spread and moving to the long 520 call at $21^1/_8$.

The net result is that you must have become very bullish to want to shift to a long call over holding the existing butterfly. The risks and the rewards are significantly higher for the long call than the butterfly. This example uses the 520 call and understates the attractiveness of shifting to the other call, the 530. The 530 call would have less premium and, therefore, less risk. Nonetheless, you still need to be much more bullish to be induced to shift to the long call strategy.

The alternative to a long call is to hold one of the short puts. This has less profit potential than the long call and more risk. The main advantage is that you will make money at a lower level compared with the long call. Another advantage is that you are selling, rather than buying, time premium.

The final possibility is to *roll up*, which entails liquidating the current butterfly and initiating a new position with higher strike prices. You may take a loss on the initial position, looking to increase your profit potential if prices stay at their current position. Table 17.9 shows an example of rolling up so that the middle strike is at-the-money. In this case, you are rolling up to the 525, 530, and 535 strikes with prices of $12^1/_2$, 10, and $8^1/_4$, respectively. A more bullish tactic is to raise the strike prices even further.

TABLE 17.9 Long Butterfly Results and Roll Up Results

Price	Original butterfly	New butterfly
520	$-1/4$	$-3/4$
525	$+4\,3/4$	$-3/4$
530	$-1/4$	$+4\,1/4$
535	$-1/4$	$-3/4$

You have basically shifted your profit zone to a higher level at a cost of additional commissions and probably a loss on the original butterfly. Nonetheless, this is a viable tactic if you are convinced that prices will not change much from their current level.

Neutral Strategies If the UI price rises and you look for prices to stabilize, you could:

1. Hold the position;
2. Liquidate the position; or
3. Roll up.

Holding the current position makes sense if the UI price will stay within the limits of the two break-even points. Otherwise, you should consider one of the other tactics.

Liquidating the position can make sense if prices have risen to outside the profit zone and if you can limit your losses to something less than the initial risk. Because the risk in long butterflies is usually very low, most investors do not liquidate their existing position, waiting, instead, for the price to drop back into the profit zone.

Rolling up is also sensible if you are looking for prices to stabilize. You will be swapping a small loss in the original butterfly plus some commissions for a greater chance at profit at current levels. Table 17.6 and the discussion surrounding it show the potential value of this tactic.

Bearish Strategies If the UI price rises and you are bearish, you could:

1. Hold the position;
2. Convert to bear spread; or
3. Convert to short call(s) or long put(s).

TABLE 17.10 Long Butterfly Results and Bear Call Spread Results

Price	Long butterfly	Bear spread
520	$-^1/_4$	$+2^1/_4$
525	$+4^3/_4$	$+2^1/_4$
530	$-^1/_4$	$-2^3/_4$
535	$-^1/_4$	$-2^3/_4$

Holding the current position makes sense if the UI price will stay within the limits of the two break-even points. For example, prices might have rallied to above the upper break-even point. Now that you are more bearish, it makes sense to hold the position, looking for it to slump back into the profit zone. On the other hand, if you are so bearish that you think the price will go to below the down-side break-even, you will still want to hold the position and liquidate it when it moves to the middle strike price.

Liquidating the position can make sense if prices have rallied to outside the profit zone and if you can limit your losses to something less than the initial risk. Because the risk in long butterflies is usually very low, most investors do not liquidate their existing position, waiting, instead, for the price to drop.

Converting the position into a bear spread is basically saying that you are no longer neutral on the market but have become bearish. Look at an example of the differences in results from using the long 530 call/short 525 call bear spread versus leaving the original position untouched. Table 17.10 shows these results at expiration. Assume that the trade was initiated with the following prices:

OEX = 530

December 520 call = $15^1/_2$

December 525 call = 13

December 530 call = $10^3/_4$

Net debit of $^1/_4$

However, the market has jumped to 535, you have switched to the bear side, and prices are now:

OEX = 535

December 525 call = 18

December 530 call = $15^3/_4$

TABLE 17.11 Long Butterfly Results and Short Call Results

Price	Long butterfly	Short call
520	$-1/4$	+18
525	$+4\,3/4$	+18
530	$-1/4$	+13
535	$-1/4$	+8
540	$-1/4$	+3
545	$-1/4$	−2
550	$-1/4$	−7

Notice that you will make more money sticking with the long butterfly if the market stabilizes, but you will make more money on shifting to the bear spread if the market moves lower. The drawback to the shift to the bear spread is that you are also giving up the miniscule risk of the long butterfly if the market continues higher.

Converting the position to either a short call or a long put is the most bearish alternative. This entails liquidating three of the four options in the butterfly. Continuing with the example in Table 17.10, Table 17.11 shows the results of keeping the original butterfly spread versus moving to the short 525 call at 18. Shorting the call at the middle strike can be an attractive alternative if you have turned bearish. Note, however, that the short call has greater risk if the market rallies significantly.

The alternative to a short call would be to hold a long put if you had initiated a butterfly using puts. This will have greater profit potential than the short call, but more risk. One main problem with converting to the put is that the break-even point is lower than with the short call. Another disadvantage is that you are buying, rather than selling, time premium.

CHAPTER 18

Calendar Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Calendar Spreads	Either	Either	Either	Either	Either	Either

STRATEGY

Calendar spreads are constructed by buying or selling a put or call in one expiration month and taking the opposite position in a farther expiration month. Calendar spreads can be constructed that are bullish, bearish, or neutral.

A *bullish calendar spread* can be constructed by using a *strike price above the current market price.* For example, the current price of the underlying instrument (UI) is 50, and you sell a nearby option and buy a far option, both with a strike of 60. However, note that the ideal circumstance is that the market does not go above the strike of 60 because then the high gamma of the front option will kick in and cause a significant loss on the front leg that will not be covered by a profit on the far leg. In effect, this situation is bullish but not wildly bullish.

A *bearish calendar spread* can be constructed by using a strike price *below the current UI price.* With a current UI price of $50, you would sell a nearby call and buy a far call with a strike of $40.

There are two ways to construct *neutral* calendar spreads. The first way is by *selling a nearby at-the-money option and buying a farther expiration contract with the same strike.* This strategy is used when you are looking for prices to remain stable but want to capture the time decay of the nearby option. For example, you could sell the United Airlines (UAL) November 60 calls for 2 and buy the February 60 calls for $3^7/_8$ when the price of UAL is 59.

The second way to construct a neutral calendar spread, called a *reverse calendar spread*, is by *buying the nearby option and selling the far option.* A large price move in the UI is required before the reverse calendar will profit. Unfortunately, the decay in the time premium works against the trade. The basic issue of the reverse calendar spread is that the effect of gamma will overwhelm the effect of theta. In other words, the UI price will move quickly in one direction. Basically, this is the inverse of the regular calendar spread, so you can take the following discussion and turn it on its head to see what the selection and follow-up strategies should be for a reverse calendar spread.

RISK/REWARD

Break-Even Point

Break-even points for calendar spreads are impossible to ascertain because one leg of the spread is left open when the first leg expires.

Unfortunately, because the time decay is unknown, the break-even points cannot be effectively estimated. Changes in the implied volatility can also have a big impact on the break-even point. In addition, the time premium changes as the UI price changes. One change occurs as the UI price moves past different strike prices. For example, you might initiate a position at one strike price, which will have the greatest time value, but, as the UI price moves higher or lower, the at-the-money option will change to different strike prices, thus reducing the time value of the original option. Assume that you initiate a calendar spread using the options on Treasury-bond futures using the September and December $96^0/_{32}$ strikes when the price of the underlying futures contract is $96^5/_{32}$. These options, being the at-the-money options, will have the greatest time premium. Their time premium will contract if the price of the bonds moves significantly in either direction.

Investment Required

The investment for a calendar spread is the net debit. Assume the following prices:

Exxon = 67

October 65 call = $2^1/_4$

November 65 call = $2^3/_4$

The calendar spread would be constructed by buying the November 65 call for $2^3/_4$ and selling the October 65 call for $2^1/_4$. The net debit and the net investment will be 0.50 ($2^1/_4 - 2^3/_4 = -^1/_2$). The assumption here is that the strikes are the same. Clearly, the net investment is not necessarily a debit if the strikes are different.

Maximum Risk

Unfortunately, you cannot pinpoint precisely the points of maximum risk because you cannot know the amount of time decay on the far option. At the expiration of the nearby contract, you will still be holding another option. The time premium on the far option will be affected by such factors as time remaining before expiration, implied volatility, and distance from the current UI price. As a result, you can only estimate the maximum risk in the trade by making assumptions about the future time premium of the far option in the calendar spread. This means that you should have some type of options evaluation model and a market opinion to help estimate where your risk will be at its maximum.

Profit Potential

The profit potential for a calendar spread is unlimited but cannot be reduced to a formula. This is because of the myriad of possible price scenarios and the many possible responses to those scenarios. For example, you might initiate a calendar spread, see the price drop to below the nearby strike price, the nearby option expire worthless, and then the market rally. You could liquidate the whole trade at the lower level or hang onto the far call looking for a rally. This example shows making a profit on both a short nearby option and a long far option. But the price scenario could be different, and your responses to the market action could vary dramatically. As a result, the description of the profit potential cannot be neatly packaged. Nonetheless, Figure 18.1 shows an example of the option chart for a neutral calendar spread.

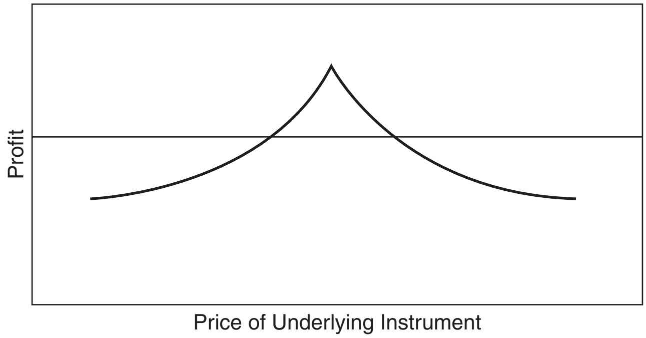


FIGURE 18.1 Calendar Spread

DECISION STRUCTURE

Selection

An important goal of a calendar spread is to capture the time premium of the nearby expiration option. This means that the ideal situation is to sell a nearby option with a high time premium and a high implied volatility and to sell a far contract with relatively low time value and relatively low implied volatility. Unfortunately, this ideal situation is rarely achieved.

As a practical matter, this means that initiation should take place when time decay is at its greatest. You, therefore, should be looking to initiate this trade just as the option time premium is beginning to descend rapidly. (The formula for estimating the time decay was given in Chapter 4).

Neutral calendar spreads are initiated close to at-the-money. This gives the greatest time decay to the nearby option while giving the greatest chance of movement to help the far option.

For bull and bear calendar spreads, you should put the point of maximum profit potential at your price objective. For example, you might expect the price of Colgate to rally to 45 from its current price of $38^1/_2$. Therefore, you should sell the nearby option with a strike of 45 and buy the same strike price in a farther option.

Another factor to consider is the expiration month. Usually, traders use the two nearest expirations. These options have the greatest liquidity, a major advantage. However, you should look at your market opinion and then decide which expirations make the most sense.

If the Price of the Underlying Instrument Drops

Bullish Strategies If the UI price drops and you are bullish, you could:

1. Liquidate the position; or
2. Liquidate the short option.

You could *liquidate the position* if you are satisfied with the profits on the trade after the decline in prices. You might also want to liquidate the trade if you are looking for higher prices and there is too much time until the expiration of the nearby option. Remember that the best thing that could happen would be a drop in prices, with the nearby option expiring, followed by a big rally. You then would make the maximum on both legs of the spread.

A more aggressive tactic is to *liquidate the short call.* You have then shifted your position to a long call. This means that you will need the market to trade significantly higher before you make a profit on the trade, but you now have much more profit potential.

Neutral Strategies If the UI price drops and you are looking for stable prices, you could:

1. Hold the position if within the expected profit zone;
2. Liquidate the position if below expected break-even; or
3. Roll down.

You could *hold the position* if prices have not moved to below your expected break-even at expiration of the first contract. You might be able to pick up some extra time decay, though you have extra price risk.

You could *liquidate the position* if the UI price has fallen below the expected break-even point. There is no reason for holding a position that is losing money and is expected to lose money.

A third choice would be to *roll down* to a lower strike in both of the options. In effect, you are saying that your original strategy was correct but that the timing was premature. Rolling down will give you the chance to make money at the new price level. This can be a very attractive tactic because it increases the chance of making money, and yet you might have been able to make a profit on the original calendar spread after prices have fallen.

Bearish Strategies If the UI price drops and you are bearish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Roll down.

You might want to *hold the position* if the time decay in the near option is evaporating quickly and you are making more money on the near contract than you are losing on the far contract. Holding the position also gives you the possibility of holding the long far contract after the expiration of the near contract. However, this tactic should only be used if you expect the UI price to stay within the profit zone.

It might be best to *liquidate the position* if there is little time decay in the near contract and the price is expected to move even farther beyond the estimated break-even points. You might be able to liquidate the trade with a small profit or small loss now rather than wait for a larger loss later.

A final choice is to *roll down*. You would replace the current strike with a strike at your down-side objective. For example, your original strike could have been at-the-money at 55. Prices may have since dropped to 50, and you expect prices to drop to 45. Rolling down entails liquidating the two options with strikes of 50 and initiating the same calendar spread, but with the strikes at 45. In effect, you have liquidated a neutral calendar spread in favor of a bearish calendar spread.

If the Price of the Underlying Instrument Rises

Bullish Strategies If the UI price rises and you are bullish, you could:

1. Liquidate the position; or
2. Liquidate the short call.

It might be best to *liquidate the position* if there is little time decay in the near option and the price is expected to move even farther beyond the estimated break-even points. You might be able to liquidate the trade with a small profit or small loss now rather than wait for a larger loss later.

A more aggressive tactic is to *liquidate the short call*. You have then shifted your position to a long call. This means that you will need the market to trade significantly higher before you make a profit on the trade, but you now have much more profit potential.

Neutral Strategies If the UI price rises and you are looking for stable prices, you could:

1. Hold the position if within the expected profit zone;
2. Liquidate the position if below expected break-even; or
3. Roll up.

You could *hold the position* if prices have not moved to above your expected break-even at expiration of the first contract.

You could *liquidate the position* if the UI price has fallen below the expected break-even point.

A third choice would be to *roll up* to a higher strike in both of the options. In effect, you are saying that your original strategy was correct but that the timing was premature. Rolling up will give you the chance to make money at the new price level. This can be a very attractive tactic because it increases the chance of making money, and yet you might have been able to make a profit on the original calendar spread after prices have risen.

Bearish Strategies If the UI price rises and you are bearish, you could:

1. Hold the position; or
2. Liquidate the long call.

The basic idea behind *holding the position* is for the UI price to drop back into the profit zone. Usually, you will be holding a slightly unprofitable position if prices have rallied. A drop in price will often bring the calendar spread back into a profitable position.

A more aggressive tactic is to *liquidate the long call.* You have then shifted your position to a short call. This means that you will likely be making a profit at a higher level than with the calendar spread and will probably have a greater profit potential for the near term. Another advantage is that you are selling time premium with less time remaining, thus receiving the benefit of the faster time decay that occurs closer to expiration. One disadvantage is that you will be giving up the profit potential of the long call in the long term. In addition, you are taking on more price risk when you carry a naked short call.

CHAPTER 19

Ratio Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Ratio Spreads	Either	Either	Either	Either	Either	Either

STRATEGY

There are two types of ratio spreads: long and short. A *long ratio spread* buys low-strike calls and sells a larger quantity of higher strike calls, or it buys high-strike puts and sells a larger quantity of lower strike puts. A *short ratio spread* is the reverse position of the long ratio spread. However, it is rare that a short ratio spread will outperform similar strategies. As a result, the rest of this chapter focuses on long ratio spreads, and the term *ratio spreads* refers only to *long* ratio spreads.

Ratio spreads are covered extensively in Chapters 11 and 14. This chapter adds to those discussions but mainly focuses on the lowest risk long ratio spreads—the spread is guaranteed to make money if the price of the underlying instrument (UI) moves in one direction.

Ratio spreads are similar to covered writes. A ratio spread is usually considered neutral strategy, but adjusting the number of short options can change the nature of the spread. The generic ratio spread will have a net delta of zero. Adjusting the number of short options changes the net delta of the position. Assume you want to initiate a ratio spread. Reducing the number of short options to just one converts the ratio spread to a bull spread. A more bearish position can be created by selling enough options to shift the net delta from zero to a negative number.

In general, you are trying to create a delta-neutral position. Whenever you are doing a ratio spread, find the delta of the total position to see if the position is net long or net short and if that market exposure fits with your market outlook or strategy.

Ratio spreads are considered neutral strategies because the greatest profit occurs between the selected strike prices. In effect, you are looking for stable prices when you initiate a ratio spread. However, note that rolling up or down to keep the UI price between the two strike prices allows you to go with the market if it moves in either direction. You are trying to make more money on the time-premium decay on the short options than you lose on the long option.

One interesting feature of ratio spreads is that they can be initiated with risk in only one price direction. You will only lose money if prices move in the direction of the short options strike.

Look at an example of a ratio spread. Assume the following:

S&P 500 = 537.75

December 530 call price = 11.00

December 530 call delta = 0.69

December 540 call price = 5.50

December 40 call delta = 0.46

You would construct a delta-neutral ratio spread by first finding the ratio of the deltas of the two options. In this case, the ratio of the two deltas is ${}^{0.69}/_{0.46}$, or 1.5. This means that you will need to short 1.5 of the December 540 calls for every long December 530 call. For example, you will sell 75 December 540 calls if you are long 50 December 530 calls.

EQUIVALENT STRATEGY

A ratio spread is very similar to a ratio covered write, but there are several differences. The major advantage of a ratio spread is that it has less dollar risk. The major risk in a delta-neutral ratio writing or ratio spreading program is that the UI price moves sharply in one direction or another and you are unable to adjust the portfolio to reflect the new net delta of the portfolio. A ratio spread has a built-in safety net with the long call instead of the long UI. There is no unlimited risk on the down-side because the long call has a limited risk.

Another effect of the use of a long call instead of a UI is that you can make more money on the down-side. The call's premium will eventually deteriorate if the price declines, yet you will be continually rolling down the short options as the price declines. Your position will become increasingly delta short even though you have not increased your risk relative to the initial price level. This is because the position would be delta neutral again if the price rallied back to the initial level. The net effect is that you can make more money on the down-side than on the up-side by simply leaving the original long call intact.

The disadvantage of the ratio spread versus the ratio write is that you are buying time premium when you buy the long call. One of the major objects of ratio writing and spreading is to capture the time decay in the short options. A ratio spread counteracts much of that gain by being long a call with its own decaying time premium.

RISK/REWARD

Maximum Profit

The maximum profit equals the number of long calls or puts multiplied by the difference between the strikes, plus or minus the initial credit (plus if initiated for a credit, minus if initiated for a debit). This rather complicated formula can be easily grasped with the help of an example. Assume the following situation:

Squibb $= 103$
January 100 calls $= 8^1/_2$
January 105 calls $= 6^3/_8$

You are quite bearish and sell three January 105 calls and buy only one January 100 call. The net credit on the trade is $10^5/_8$. The maximum profit, assuming no follow-up action, is the number of long calls, 1, times the difference in strike prices, 5: $1 \times 5 = 5$. Then add the net credit: $10^5/_8 + 5 = 15^5/_8$.

Break-Even Point

For a call ratio spread, the up-side break-even point equals the high strike price plus the result of dividing the maximum profit by the number of naked options.

For a put ratio spread, the down-side break-even point equals the low strike price minus the result of dividing the maximum profit by the number of naked options.

Remember that these formulas only apply to a ratio spread that you do not adjust after entry. Look at an example. Assume the same situation as in the previous section. Your maximum profit was $15^5/_8$. This means that the up-side break-even can be calculated by first dividing the maximum profit, $15^5/_8$ by the number of naked options, 2: $15^5/_8 \div 2 = 7^{13}/_{16}$. Add this to the high strike price, 105, making the up-side break-even point $112^{13}/_{16}$.

Risk

If the trade is put on for a credit, there is no risk in one price direction, the direction of the short option. At expiration, the short options will be losing dollar for dollar with the UI for each naked short option.

If the trade is initiated for a debit, the risk is the debit in the direction of the long option, plus the short options will be losing dollar for dollar with the UI for each naked short option.

DECISION STRUCTURE

Selection

The first decision is your market stance. Generally, ratio spreads are neutral strategies, though you can adjust the market stance by adjusting the ratio and by adjusting the strike prices. For example, using calls, the more short calls you write, the more bearish the position. The lower the strike prices, the more bearish the position.

A major question is whether you require this trade to be done at a credit or whether you will accept a debit spread. It would be useful to examine the chapters on ratio covered writing (Chapters 11 and 14) for further details on the implications of a delta-neutral strategy.

As a general rule, you should be striving to buy intrinsic value and to sell time value. This suggests that you should generally be buying far in-the-money options and selling at-the-money or slightly out-of-the-money options.

If the Price of the Underlying Instrument Moves Significantly while a Delta-Neutral Position is Held

If the UI price moves significantly while a delta-neutral position is held, basically, you will be trying to keep the position as delta neutral as possible throughout the life of the trade. This will theoretically eliminate price risk as a consideration. In addition, it should maximize the amount of time premium that is captured. The tricky task is to keep the trade delta neutral. The problem is that the deltas of the options change as the UI price changes. If the UI price climbs, the delta of the short options increases more than the delta of the long options, thus making you increasingly short. A declining UI price will make your position increasingly long. Therefore, you must continually adjust the ratio of the long to short options.

For example, you are long 100 options on the S&P 500 futures contract with a strike of 530 and a delta of 0.69, and you are short 150 contracts of the S&P 500 options with a strike of 540 and a delta of 0.46. The current price of the futures contract is 537.75. If the price of the S&P 500 climbs to 543, the delta of the options will climb to, say, 0.79 and 0.58, respectively. Thus, you will be the equivalent of short eight contracts of the futures. This can be found by multiplying the delta of the long option, 0.79, by the number of long options, 100, and subtracting the result of multiplying the number of short options, 150, by the delta, 0.58: $(0.79 \times 100) - (0.58 \times 150) = -8$.

You will now be exposed to risk if the market continues higher. You, therefore, must adjust the number of contracts you are using to reduce to zero the net delta of the position. In this example, the net delta of the long side is found by multiplying a delta of 0.79 by 100, the number of long options: $0.79 \times 100 = 79$. To find the new quantity of options, divide the net delta by the new delta, 0.58: $79 \div 0.58 = 136.2$, which will have to be rounded to 136. You should then liquidate 14 of your short options to bring your portfolio to the proper weighting of 136.

Note that you will have to resell those 14 contracts if the UI price drops back down to 537.75. In addition, a further drop in price would require you to sell additional contracts.

It should be clear that ratio spreading requires active management. You simply cannot go away for a vacation and expect to still have a delta-neutral position. Note also that the more the price moves in one direction the more the delta is moving against you.

A second adjustment should also be made to the position after the UI price has moved. Remember, the point of the trade is to capture time premium. Therefore, you should roll up or down as the UI price moves from the initial strike price to another strike price. For example, if the price of the S&P 500 futures moves from 540 to 550, you should buy back your 540 calls and sell 550 calls. Conversely, if the UI price should drop to a lower strike price, you should roll down out of your current strike price and into the new at-the-money option.

There is a major problem with a ratio spreading program: How often should the portfolio be rebalanced? Theoretically, you should rebalance every time there is a price change that implies a change of one contract in the short call position. The trade-off is that continual adjusting may create too many commissions. This will occur if the UI price jumps back and forth in a narrow range. You will be adjusting your short call portfolio with every jump in the UI price, creating commission expense; yet the UI price will not really break out of its range.

Unfortunately, there is little that can be done about this except to not adjust the portfolio as often as would be suggested by keeping the trade delta neutral. The risk of this tactic is that the market will move enough in one direction to create a market exposure and you lose money because of this exposure. In the final analysis, it is probably better to adjust whenever necessary and pay the extra commissions as the cost of not exposing yourself to market risk.

If the Price of the Underlying Instrument Rises

Ratio Call Spreads If you are bullish, you could:

1. Liquidate the short options;
2. Liquidate the position; or
3. Roll up.

The most aggressive approach would be to *liquidate the short options.* This would shift the position to a net long call position. Hopefully, you are adjusting the position because of newfound bullishness, not because you lost money due to a poor adjustment to the ratio because of the higher prices. If you are adjusting because you are now bullish, you might have a slight profit in the trade because of the decay in the time premium. Thus, you will be shifting to a long call position with a profit that, in effect, raises the break-even point. One problem with this tactic is that you likely initiated the original ratio spread with little time left before expiration. This means that you will be buying time premium when time is working significantly against you.

A more conservative and probably the most flexible approach is to *liquidate the position.* You will then be able to select from a larger variety of bullish positions to take.

If you have a bullish ratio spread, you might want to *roll up*. This will maximize your profits if you roll up every time the short options hit another strike price. You will then be writing more time premium while keeping your long option largely composed of intrinsic value. The same tactic should not be used for a bearish ratio spread because you should never use a bearish strategy when you are bullish.

If you expect prices to remain about the same, you could:

1. Hold the position if profitable; or
2. Roll up if unprofitable.

If the position is profitable, you are likely holding a bullish ratio spread, and *holding the position* can make sense. Holding the position will mainly accomplish the goal of capturing the time premium on the short options.

If the position is unprofitable, you are likely holding a bearish ratio spread, and *rolling up* to higher strike prices may help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

If you are bearish, you could:

1. Hold the position if profitable; or
2. Sell more calls.

If you are holding a bearish ratio spread, then *holding the position* makes sense. You have the right strategy, but you have initiated the trade at too low a price. A slide in prices will put the trade back on a firm footing.

A more aggressive approach would be to *sell more calls* or liquidate some long calls. The ultimate version of this tactic is to liquidate all the long calls. You have to be very confident of your bearish prognostication because of the greater risk of a naked short call position. However, the potential reward is also much higher.

Ratio Put Spreads If you are bullish, you could:

1. Hold the position if initiated at a credit;
2. Liquidate the long option; or
3. Roll up.

If you were able to initiate the ratio put spread at a credit, you can *hold the position*. You have no up-side risk in a ratio put spread if initiated for a credit. As a result, you should continue to hold the position. Holding the position will give you additional time for prices to move back to the maximum profit point.

The most aggressive choice is to *liquidate the long put* and simply carry the short puts. This will create large profits if prices move higher but will bring very large losses if prices change direction and fall.

A more moderate alternative is to *roll up*. If the position is profitable, you are likely holding a bullish ratio spread. Rolling up to higher strike prices will maximize the time premium that you capture. Make sure the short option is at-the-money, whereas the long option is in-the-money.

If you expect prices to remain about the same, you could:

1. Hold the position if profitable; or
2. Roll up if unprofitable.

If the position is profitable, you are likely holding a bullish ratio spread, and *holding the position* can make sense. Holding the position will mainly accomplish the goal of capturing the time premium on the short options.

If the position is unprofitable, you are likely holding a bearish ratio spread, and *rolling up* to higher strike prices may help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

If you are bearish, you could:

1. Hold the position; or
2. Buy more puts.

If you are holding a bearish ratio spread, then *holding the position* makes sense. You have the right strategy, but you have initiated the trade at too low a price. A slide in prices will likely add to your profits.

A more aggressive approach would be to *buy more puts* or liquidate some of your short puts. The ultimate version of this tactic would be to liquidate all the short puts. You would have to be very confident of your bearish prognostication because of the somewhat greater risk of a long put position. However, the potential reward is also much higher.

If the Price of the Underlying Instrument Drops

Ratio Call Spreads If you are bullish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate the short options or buy more calls.

If you have a bullish ratio call spread, then *holding the position* makes sense. The UI price has moved lower, but you are now looking for the market to move in your direction. Therefore, your position should begin to show a profit if your market opinion is correct. On the other hand, you will not want to hold the position if you have a bearish ratio spread.

If you initiated a bearish ratio spread, then you should consider *liquidating the position.* There is never any reason to hold a bearish position if you are bullish.

The most aggressive approach would be to *liquidate the short options* or buy more calls. This would shift the position to a net long call position. Hopefully, you are adjusting the position because of newfound bullishness, not because you lost money due to a poor adjustment to the ratio because of the higher prices. If you are adjusting because you are now bullish, you might have a slight profit in the trade because of the decay in the time premium. Thus, you will be shifting to a long call position with a profit that, in effect, raises the break-even point. One problem with this tactic is that you likely initiated the original ratio spread with little time left before expiration. This means that you will be buying time premium when time is working significantly against you.

If you expect prices to remain about the same, you could:

1. Hold the position if profitable; or
2. Roll down if unprofitable.

If the position is profitable, you are likely holding a bearish ratio spread, and *holding the position* can make sense. Holding the position will mainly accomplish the goal of capturing the time premium on the short options.

If the position is unprofitable, you are likely holding a bullish ratio spread, and *rolling down* to lower strike prices might help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

If you are bearish, you could:

1. Hold the position if initiated at a credit;
2. Roll down; or
3. Liquidate the long calls or sell more calls.

If you are holding a bearish ratio spread, then *holding the position* makes sense. An expectation of lower prices will lead to greater profits. No matter what market bias you have, consider holding the position whenever you have initiated the trade for a credit.

If the position is unprofitable, you are likely holding a bullish ratio spread, and *rolling down* to lower strike prices might help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

A more aggressive approach is to *sell more calls or liquidate some long calls.* The ultimate version of this tactic is to liquidate all the long calls. You have to be very confident of your bearish prognostication because of the greater risk of a naked short call position. However, the potential reward is also much higher.

Ratio Put Spreads If you are bullish, you could:

1. Hold the position if initiated at a credit; or
2. Liquidate the long puts or sell more puts.

If you were able to initiate the ratio put spread at a credit, then you can *hold the position.* You have no up-side risk in a ratio put spread if initiated for a credit. As a result, you should continue to hold the position. If you have a bullish ratio put spread, then holding the position will give you additional time for prices to move back to the maximum profit point.

The most aggressive choice is to *liquidate the long puts* or sell more short puts. This will bring large profits if prices move higher, but it will have very large losses if prices change direction and fall. You must have a firm opinion about the expected rally.

If you expect prices to remain about the same, you could:

1. Hold the position if profitable; or
2. Roll down if unprofitable.

If the position is profitable, you are likely holding a bearish ratio spread, and *holding the position* can make sense. Holding the position will mainly accomplish the goal of capturing the time premium on the short options.

If the position is unprofitable, you are likely holding a bullish ratio spread. *Rolling down* to lower strike prices might help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

If you are bearish, you could:

1. Hold the position if profitable;
2. Liquidate the position;
3. Buy more puts or liquidate the short puts; or
4. Roll down if unprofitable.

If the position is profitable, you are likely holding a bearish ratio spread, and *holding the position* can make sense. Holding the position will mainly accomplish the goal of capturing the time premium on the short options.

If you are holding a bullish position, then the most flexible approach is to *liquidate the position.* You will then be able to select from a larger variety of bearish positions to take.

A more aggressive approach would be to *buy more puts or liquidate some of your short puts.* The ultimate version of this tactic would be to liquidate all the short puts. You would have to be very confident of your bearish prognostication because of the somewhat greater risk of a long put position. However, the potential reward is also much higher.

If the position is unprofitable, you are likely holding a bullish ratio spread, and *rolling down* to lower strike prices might help recover some of the losses. This is basically a tactic to try to maximize the time premium that you capture. Thus, the short options should be at-the-money, whereas the long options should be in-the-money.

CHAPTER 20

Ratio Calendar Spreads

Strategy	Price Action	Implied Volatility	Time Decay	Gamma	Profit Potential	Risk
Long Straddles	Either Way a Lot	Increasing Helps	Hurts	Helps	Unlimited	Limited

STRATEGY

The *ratio calendar spread* is a blending of ratio spreads and calendar spreads. It consists of selling nearby options and buying fewer of a farther option. For example, you could sell 4 of the July 40 calls and buy 2 of the October 40 calls.

The amount of bullishness or bearishness can be controlled by the ratio of the long and short options. A neutral spread can be constructed as a delta-neutral strategy and then kept neutral throughout the time period. Alternately, positions can be engineered that have a bullish or bearish bias.

Ratio calendar spreads are good low-risk investments that can give a steady return. They capture the higher time decay of the nearby option but maintain the hedge of the far option. In addition, ratio calendar spreads have the potential for large gains after the nearby option expires because of the still-existing long-term option (see Chapter 18 and Chapter 19).

RISK/REWARD

Unfortunately, there are no formulas to identify the risk and rewards of ratio calendar spreads. The strategy is too dynamic to reduce to formulas. Much of the profit or loss is related to time decay of two different options. Thus, concepts such as break-evens are changing all the time. However, profits and losses can be estimated using a computer program that simulates time decay. (The ramifications of time decay are addressed in Chapter 18.)

DECISION STRUCTURE

Selection

First, determine your overall strategy. There are two major strategies with ratio calendar spreads: market bias or delta neutral. The first strategy attempts to construct a ratio calendar spread that will profit through changes in the price of the underlying instrument (UI) by adjusting the various strike prices and ratios of near to far options. The second strategy looks mainly to capture the time premium of the nearby option but to retain the possibility of large capital gains after the nearby option expires.

If you have a *market bias*, use the deltas of the various options to determine the correct market exposure. Select a strike price that corresponds with your expected price scenario. Preferably, you will initiate the trade at a credit. This will ensure a profit even if prices do not move. However, there is a trade-off. In general, a large credit will occur only if you have shorted a relatively large number of options relative to the long side. The greater the ratio, the greater price risk if the position goes against you.

For a *delta-neutral strategy*, set up the initial position with the total delta of the nearby option position equal to the total delta of the far option. A main object of this trade is to capture the time premium of the nearby option. Therefore, you should be writing the at-the-money option. Preferably, you will also be selling an option with a high implied volatility and buying one with a low implied volatility.

If the Price of the Underlying Instrument Changes Significantly

With the *delta-neutral strategy*, you will adjust the longs and shorts to maintain delta neutrality. In addition, you can roll up or down to new strikes if the transaction costs are not prohibitive (that is, net gain in selling time premium is greater than transaction costs).

With a *market bias strategy*, you might want to liquidate the trade if the UI price moves through the estimated eventual break-even point before the expiration of the nearby contract. Assume you have a 2:1 ratio in July and October options. Your ideal scenario would be a drop in price to below the strike price, with the nearby option expiring worthless, and then the UI price moving strongly higher. However, the UI price might move higher before the July expiration, necessitating a defensive liquidation. Note how important your market outlook is. You should definitely liquidate the position if you look for prices to continue higher before expiration. A bearish outlook suggests that you hold the original position. (Chapter 18 and Chapter 19 will be helpful in understanding the potential follow-up tactics.)

CHAPTER 21

Straddles and Strangles

STRATEGY

There are two types of straddles: long and short. A *long straddle* is constructed by being long both a call and a put. A *short straddle* is constructed by being short both a call and a put.

Straddles are generally considered neutral strategies because the put and the call are usually both at-the-money options. This means that the long straddle will profit if the price of the underlying instrument (UI) moves significantly in one direction or the other. The short straddle will profit if the (UI) price stays in a narrow range. Typically, straddles are put on with the strike price being near the current UI price. Long straddles are always initiated for a debit, while short straddles are always initiated at a credit. Figures 21.1 and 21.2 show option charts for straddles.

A *strangle* is the most common combination other than a straddle. This is simply a straddle with different strike prices. (See Figures 21.3 and 21.4 for examples of option charts for strangles.) For example, a long straddle would be long the $50 call and long a $50 put. A long strangle would be long the $60 call and long a $40 put.

The analysis of strangles is essentially identical to that of straddles. Therefore, the rest of this chapter just refers to straddles, unless there are differences worth mentioning between straddles and strangles.

Note also that bullish and bearish straddles and strangles can be constructed. For example, a bullish long straddle would have the strike prices below the current UI price, thus maximizing the profits on the bull side but increasing the chances of losses if prices move lower. A bullish short

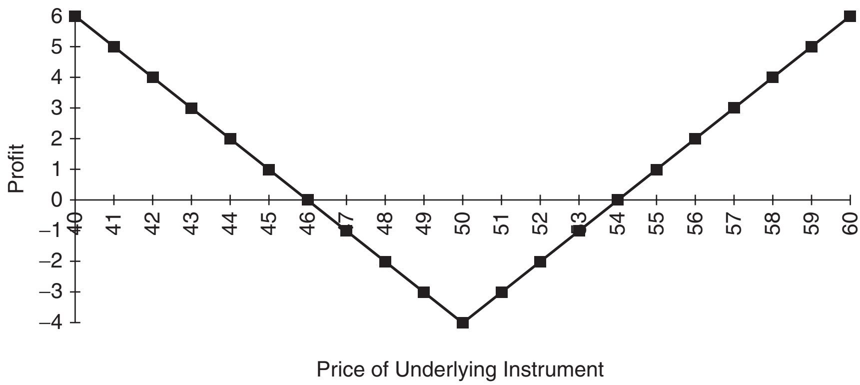


FIGURE 21.1 Long Straddle

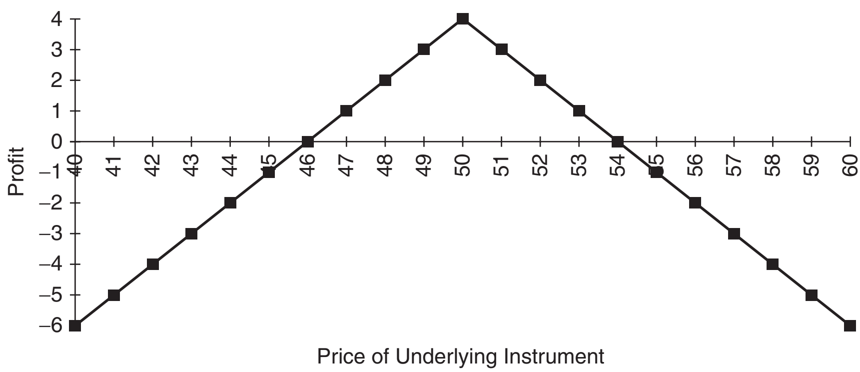


FIGURE 21.2 Short Straddle

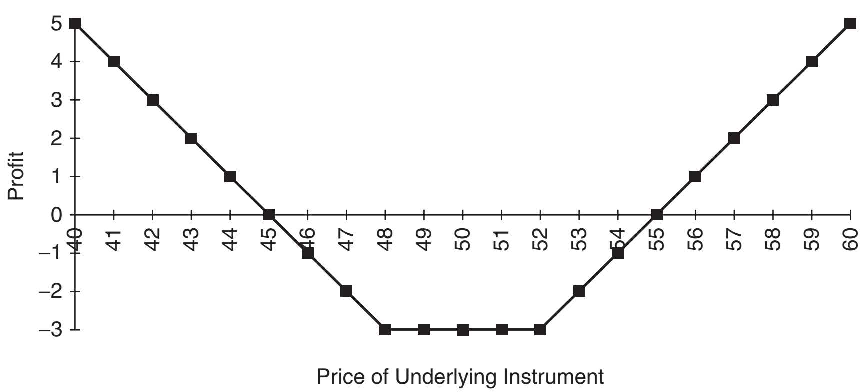


FIGURE 21.3 Long Strangle

FIGURE 21.4 Short Strangle

straddle would be constructed by selecting strike prices above the current UI price. Prices would have to rise to within the two break-even points before you would profit.

RISK/REWARD

Maximum Profit

Long Straddle For the long straddle, maximum profit is unlimited. Once one of the break-even points is breached, the profit will be equal, dollar for dollar, the amount that the UI is above or below the break-even at expiration. Thus, you will want the UI price to trend strongly in one direction.

Short Straddle For the short straddle, maximum profit is the net credit. This will occur at the strike price. Thus, you will want the UI price to stagnate near the strike price of the straddle.

Break-Even Point

The break-even points of long and short straddles are calculated essentially the same way.

- Long Straddles

$$\text{Up-side break-even} = \text{Strike price} + \text{net debit}$$
$$\text{Down-side break-even} = \text{Strike price} - \text{net debit}$$

- Short Straddles

$$\text{Up-side break-even} = \text{Strike price} + \text{net credit}$$
$$\text{Down-side break-even} = \text{Strike price} - \text{net credit}$$

- Long Strangles

$$\text{Up-side break-even} = \text{Highest strike price} + \text{net debit}$$
$$\text{Down-side break-even} = \text{Lowest strike price} - \text{net debit}$$

- Short Strangles

$$\text{Up-side break-even} = \text{Highest strike price} + \text{net credit}$$
$$\text{Down-side break-even} = \text{Lowest strike price} - \text{net credit}$$

For example, suppose you initiated a long straddle using options on Textron for December expiration. Textron is trading at $59^3/_4$, so you buy the 60 call and the 60 put for 3 each. The net debit is $6. The strike price, $60, plus the net debit, $6, gives an up-side break-even of $66. The strike price, $60, minus the net debit, $6, gives a down-side break-even of $54.

For another example, suppose Intel is trading at $120^1/_4$ and you buy the November 120 call and the November 120 put for $10^1/_4$ each. The net credit is $20^1/_2$. The up-side break-even on a short straddle is $140^1/_2$—the strike price, 120, plus the net credit, $20^1/_2$. The down-side break-even is $99^1/_2$—the strike price, 120, minus the net credit, $20^1/_2$.

Maximum Risk

A long straddle has a limited risk of just the debit paid for the straddle. No further losses can occur. The maximum risk occurs at the strike price of the straddle.

The dollar risk on a short straddle is unlimited. Once the UI price breaches the break-even points, the loss will be dollar for dollar the amount that the UI price is above or below the break-even at expiration.

DECISION STRUCTURE

Selection

Long Straddle You will buy a straddle when:

- You look for a strong price movement in one direction, but you do not know for sure what direction it will be.
- You are expecting implied volatility to increase.

The whole purpose of a long straddle is to look for increased volatility. You want large price movements. This is often the best strategy to use when you expect the UI price to make a big move.

Unfortunately, there is a tendency for the most volatile instruments to have the most expensive straddles. The market marks up the price of the straddle whenever *it* expects an increase in volatility. For example, the price of the straddle will typically rise just before an important announcement, such as an earnings report or an important economic report. The price of the straddle then often drops sharply after the report is released because the uncertainty is gone. The converse of this also tends to be true. Cheap straddles usually occur when the market is dull and expected to stay that way.

Profits in buying straddles come from predicting an increase in either actual or implied volatility. The quick method of evaluating the profit potential of a long straddle is to compare the price range suggested by the implied volatility with your expected price range. You might consider buying the straddle if your expected price range is greater than the range implied by the implied volatility.

For example, Widgetron might be trading at $50 with the options at an implied volatility at 10 percent. This suggests that the range in the future will be between $45 and $55, or 10 percent lower and higher than $50. You might think that the earnings report coming out will propel the stock to $60 but that an earnings disappointment may hammer the stock to $40. The purchase of the straddle, therefore, may make good sense.

A second way to look at the straddle is to compare the implied volatility with the recent past of the historical and implied volatility.

Figure 21.5 shows, in bold, the implied volatility of the nearest Treasury-bond futures contract at-the-money option and, in dashed, the actual volatility over the previous six weeks. It is clear that these sometimes deviate substantially, creating opportunities for profit.

Notice how the implied volatility is low compared to previous readings. Implied volatility tends to move up and down within a wide range. The purchase of a straddle near the low end of the range can, with patience, be a profitable strategy. In this case, you will be looking for implied volatilities that are at the low end of their recent and expected range. It is much more difficult to buy straddles that have implied volatilities in the middle or high end of the range. The odds are not with you. Therefore, you must have a strong opinion about the prospects of a near-term strong-price movement.

Typically, straddles are bought on options that have a long time to expiration. Long-dated options have the highest sensitivity to volatility, or vega, and, therefore, will have the greatest price movement due to changes in implied volatility. Time decay is typically the enemy of any holder of long options. This is another reason for you to mainly focus on long-dated options when buying straddles.

The only possible exception would be to speculate on a sudden movement caused by a specific news item. In this case, you will want the highest

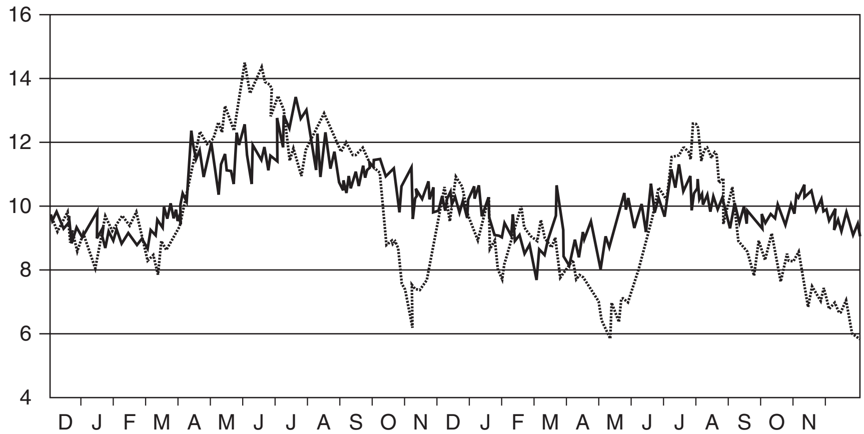


FIGURE 21.5 Nearest Implied Volatility (black) vs. Six-Week Actual (dashed) Volatility

possible gamma, or sensitivity to UI price movement. You will want to hold the position for only a few days.

Short Straddle The short straddle is the reverse situation of the long straddle. You will sell a straddle when:

- You are not looking for any price movement.
- You are looking for a situation where the market has implied a greater volatility than you expect.

You are looking for straddles where the implied volatility is high or on the high end of the range of past historical and/or implied volatilities.

This is classic strategy for investors who believe that the UI price is going nowhere fast. You do not want anything to happen when you are short a straddle. You want the price to move as if embedded in frozen molasses.

This is one of the few strategies where an investor can make money when he or she expects the price to go nowhere. Most strategies require the UI price to go *somewhere* to make money. The short straddle works in dull markets.

If the Price of the Underlying Instalment Drops

Long Straddle If the UI price drops and you are bullish, you could:

1. Hold the position;
2. Liquidate the position;

3. Liquidate the put; or
4. Roll down.

You should *hold the position* only if you look for the UI price to surmount the up-side break-even point or to move sharply higher quickly. This will usually be less likely now that prices are at a lower level. It will be rare that you will want to hold the position.

You may be able to *liquidate the position* for a profit at the lower level, particularly if implied volatility increased or the price move occurred soon after initiating the position. It usually makes sense to liquidate now, rather than risk a move back up to above the down-side break-even point. Liquidating the position is the usual preferred strategy in this situation.

The most bullish strategy would be to *liquidate the put* and stick with the long call. The net effect is that you are taking a bullish stance on the market and believe that there is no further possibility of profit on the down-side. In effect, you are initiating a new trade at the current price level. You should only consider doing this if the naked long call is a good trade on its own merits. (See Chapter 9 for details on selecting a naked long call position.)

A final possibility is to *roll down* the position. You would liquidate the current position and buy a new at-the-money straddle. You might or might not be able to lock in a profit, depending on the speed the UI price got down to the current level and/or the change in the implied volatility and/or the time remaining to expiration.

You are now giving yourself a chance to profit on the up-side, yet leaving yourself protected if the UI price continues lower. You should look at this as a new position, which means that you should review the selection criteria given in the preceding section. For example, you might not want to roll down if implied volatilities are very high and time decay is large. This is probably a time to bail out of the position instead. Alternately, you could consider rolling out to a farther expiration if the implied volatility is less.

If the UI price drops and you expect prices to remain stable, you could:

1. Hold the position; or
2. Liquidate the position.

You should *hold the position* only if you are carrying a profitable position. This means that you should now expect the UI price to stabilize below the down-side break-even point. You might also consider holding the position if you expect implied volatility to increase significantly.

However, it is very unlikely that you will want to hold the position because it is likely that a stable market will cause you to lose time decay yet show no further profits. In effect, a stable market will cause you to give up profits you already have. Remember, you bought the straddle on the idea that prices would be more volatile. Now that you think that prices will be stable, the usual reason for entering the trade is now gone.

You may be able to *liquidate the position* for a profit at the lower level. This will likely occur when the option is about to expire. It makes sense to liquidate now rather than risk a move back up to above the down-side break-even point. It also makes sense to liquidate the position if prices are expected to stabilize above the down-side break-even point. The loss will be less if the position is liquidated early than if you wait for expiration because time decay will slowly create higher losses.

If the UI price drops and you are bearish, you could:

1. Hold the position;
2. Liquidate the call; or
3. Roll down the put.

You should definitely *hold the position* if you look for lower prices. Your game plan is working, and the profits should continue to mount. The only exception, and it will be rare, is that you might consider liquidating the position if you think implied volatility is about to collapse.

A more aggressive position would be to *liquidate the call*. This will give you a long put in a declining market. Your risk will be slightly higher because you will not have the hedge of the long call to protect you against a sharp rally. Your profits will be higher than holding the original spread because you will have liquidated the call while it still had some premium left.

A key consideration is how valuable the call is. It may be worthwhile to liquidate the call if it has a lot of time value left or if the implied volatility is relatively high. On the other hand, a call with little time value and worth only a few ticks might be worth hanging onto because there is little value left but keeping it might provide some cheap protection against a sharp price hike.

In either of these first two strategies, the impact of implied volatility and time decay on the price of the straddle will be low because the put will be deep in-the-money while the call will be deep out-of-the-money.

The final possibility is to *roll down the put*. In this case, you will likely be locking in a profit on the original position or reducing the risk dramatically. Your main considerations to help determine which strike price to roll down to will be how bearish you are, the implied volatility of the various puts available, and the time to expiration (see Chapter 8). Note that you are effectively changing the original straddle into a strangle. You are now long a put and long a call but at different strike prices.

Short Straddle If the UI price drops and you are bullish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate the call.

You should definitely *hold the position* if you look for higher prices. The success of the short straddle is dependent on prices being within the two break-even points at expiration. With prices now lower than when you initiated the spread, you need a rally to help your position. Just make sure that your expectations of implied volatility still hold. Rising implied volatility could reduce or eliminate any profits that come from the expected rise in the UI's price.

You may be able to *liquidate the position* for a profit if prices are still within the break-even points. It might make sense to liquidate now rather than risk a move to below the down-side break-even point. Your confidence in the projection of higher prices will largely determine if you should liquidate. You should also consider if implied volatility will be rising in the future. An expectation of sharply higher implied volatility should push you in the direction of liquidation.

The most bullish strategy would be to *liquidate the call* and stick with the short put. The net effect is that you are taking a bullish stance on the market and believe that there is no further possibility of profit on the downside. In effect, you are initiating a new trade at the current price level. You are increasing the profit potential by decreasing the cost of the position relative to a straddle, but you are also decreasing the chances of success. (See Chapter 12 for factors to consider before naked put writing.)

If the UI price drops and you expect prices to remain stable, you could:

1. Hold the position if profitable;
2. Liquidate the position if unprofitable; or
3. Roll down.

You should strongly consider *holding the position* if you have profits in the position. The success of the short straddle is dependent on the price being within the two break-even points at expiration. If you have a profit on the trade, then prices are likely to be within the two break-even points. Stable-price action will help you because you are selling time premium, and your profits should mount as time passes. Stable prices will also likely reduce the implied volatility in the options, and this, too, will boost profits prior to expiration.

You may be able to *liquidate the position* for a profit if prices are still within the break-even points. It might make sense to liquidate now rather than risk a move to below the down-side break-even point. If the position is currently unprofitable, you are probably on the outside of the break-even points. Liquidating the trade now might limit your losses to a small amount rather than running the risk of a larger loss later.

A final possibility is to *roll down*. You would liquidate the current position and sell short an at-the-money straddle. In effect, you are starting all over again. You will most likely be selling the previous straddle at a loss, expecting to gain that loss back plus some additional profit. You are essentially saying that you sold the straddle a little early. Make sure that the implied volatility is still attractive to sell.

If the UT price drops and you are bearish, you could:

1. Liquidate the position; or
2. Liquidate the put.

You should *liquidate the position* if you look for lower prices. You will lose more money if the UI price moves lower. It is, therefore, imperative that you take a defensive action to minimize losses. Only a massive and quick collapse in implied volatility could save the position from loss.

Liquidating the put is a more bearish approach. You are now saying that the market is not neutral but bearish, and you want to jump on the bandwagon. Shifting to a naked short call will keep you on the side of writing time premium but also keep you exposed to risk if the UI price rallies sharply. (See Chapter 9 on naked call writing before using this strategy.) Remember, you are changing the original strategy from a neutral strategy to the bearish strategy.

If the Price of the Underlying Instrument Is Stable

Long Straddle If the UI price is stable and you are bullish, you could:

1. Hold the position;
2. Liquidate the position;
3. Liquidate the put; or
4. Roll out.

You should *hold the position* only if you look for the UI price to move outside the break-even points or to move sharply higher or lower quickly. Alternately, you should be expecting the implied volatility to increase from the current level. Remember that time has passed and time decay will increasingly be your enemy and that vega will have declined, making the straddle less sensitive to changes in implied volatility.

You may be able to *liquidate the position* for a profit if implied volatility has increased. You may want to liquidate the position if you do not look for a strong move to the up-side.

The most bullish strategy would be to *liquidate the put* and stick with the long call. The net effect is that you are taking a bullish stance on the market. In effect, you are initiating a new trade at the current price level. You should consider doing this only if the naked long call is a good trade on its own merits. (See Chapter 9 for details on selecting a naked long call position.)

Rolling out the position makes sense if the UI price has stabilized for a long time and time decay is starting to hurt the position. It is also likely that implied volatility has declined if the UI price has stabilized for any period of time. You need to reexamine the premises of the original trade and see if they still apply. If so, then consider rolling out to a farther expiration, thus decreasing the theta and increasing the vega.

If the UI price is stable and you expect prices to remain stable, you could:

1. Hold the position if profitable; or
2. Liquidate the position.

You should *hold the position* only if you are carrying a profitable position. This means that implied volatility has increased. You should consider holding the position only if you expect implied volatility to increase significantly. Please note that this scenario is quite unlikely. It is not often that implied volatility will increase if the UI price has been stable and is expected to remain stable.

At the same time, a stable market will cause you to lose time decay yet show no further profits. In effect, a stable market will cause you to give up profits you already have. Remember, you bought the straddle on the idea that prices would be more volatile. Now that you think that prices will be stable, the usual reason for entering the trade is now gone.

You will likely want to *liquidate the position.* Prices have been stable, and you expect them to be stable in the future. This is the worst possible scenario for your position. You are likely best off taking a small loss and going on to something else.

If the UI price is stable and you are bearish, you could:

1. Hold the position;
2. Liquidate the call; or
3. Roll down the put.

You should *hold the position* if you look for lower prices. Your game plan is finally working, and the profits should accrue. Look closely at time decay, and make sure that your expected price move will overcome the drag of time decay.

A more aggressive position would be to *liquidate the call.* This will give you a long put in a declining market. Your risk will be slightly higher because you will not have the hedge of the long call to protect you against a sharp rally. Your profits will be higher than holding the original spread because you will have liquidated the call while it still had some premium left.

A key consideration is how valuable the call is. It may be worthwhile to liquidate the call if it has a lot of time value left or if the implied volatility is relatively high. On the other hand, a call with little time value and worth only a few ticks might be worth hanging onto because there is little value left, but keeping it might provide some cheap protection against a sharp price hike.

In either of the two preceding strategies, implied volatility and time decay will carry heavy weight in your deliberations because their impact on the price of the straddle will still be high unless there are only a few days left before expiration.

The final possibility is to *roll down the put.* This is also an aggressive posture. (See Chapter 8 to help determine which strike price to roll down to.) Your main considerations will be how bearish you are, the implied volatility of the various puts available, and the time to expiration. Note that you are effectively changing the original straddle into a strangle. You are now long a put and long a call but at different strike prices.

Short Straddle If the UI price is stable and you are bullish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate the call.

You could *hold the position* if you look for higher prices. The success of the short straddle is dependent on prices being within the two break-even points at expiration. The key will be how far and how quickly prices move higher. A trivial and slow price can leave you with profits. Just make sure that your expectations of implied volatility still hold. Rising implied volatility could reduce or eliminate any profits that you probably have now.

You are likely able to *liquidate the position* for a profit because prices have been stable. It might make sense to liquidate now rather than risk a move to outside the up-side break-even point. Your confidence in the projection of higher prices will largely determine if you should liquidate. You should also consider if implied volatility will be rising in the future. An expectation of sharply higher implied volatility should push you in the direction of liquidation.

The most bullish strategy would be to *liquidate the call* and stick with the short put. The net effect is that you are taking a bullish stance on the market. In effect, you are initiating a new trade at the current price level. You are increasing the profit potential by decreasing the cost of the position relative to a straddle, but you are also decreasing the chances of success. (Review Chapter 12 for factors to consider before naked put writing.)

If the UI price is stable and you expect prices to remain stable, you could:

1. Hold the position if profitable; or
2. Liquidate the position if unprofitable.

You should strongly consider *holding the position* if you have profits in the position. The success of the short straddle is dependent on the price being within the two break-even points at expiration. If you have a profit on the trade, then prices are likely to be within the two break-even points. Stable-price action will help you because you are selling time premium and your profits should mount as time passes. Stable prices will also likely reduce the implied volatility in the options, and this, too, will boost profits prior to expiration.

You may be able to *liquidate the position* for a profit if prices are still within the break-even points. It might make sense to liquidate now rather than risk a move to outside the break-even points. If the position is currently unprofitable, implied volatility has increased. You should consider liquidating the position only if you think that implied volatility will increase the value of the straddle more than time decay will drag it down.

If the UI price is stable and you are bearish, you could:

1. Hold the position;
2. Liquidate the position; or
3. Liquidate the put.

Holding the position makes sense if you look for only a shallow and slow dip in prices. The loss in the UI price should be more than compensated by time decay for you to want to hold the position. Alternately, you may want to hold the position longer if you expect a drop in implied volatility.

You should likely *liquidate the position* if you look for lower prices. You will lose money if the UI price moves lower sharply or quickly. The key is how fast and far the UI price is expected to fall. Consider the effect of theta and vega before liquidation. Still, liquidation is the most likely strategy to follow because the original premise is being damaged.

Liquidating the put is a more bearish approach. You are now saying that the market is not neutral but bearish, and you want to jump on the bandwagon. Shifting to a naked short call will keep you on the side of writing time premium but also keep you exposed to risk if the UI price rallies sharply. (See Chapter 9 on naked call writing before using this strategy.) Remember, you are changing the original strategy from a neutral strategy to the bearish strategy.

If the Price of the Underlying Instrument Rises

Long Straddle If the UI price rises and you are bullish, you could:

1. Hold the position;
2. Liquidate the position;
3. Liquidate the put; or
4. Roll up.

You should likely *hold the position* if you look for higher prices. Your game plan is working, and the profits should continue to mount. If prices have moved enough, you will not have to consider implied volatility and time decay because both the put and call will have little vega or theta. However, these might have to be checked if the UI has only moved slightly.

You might be able to *liquidate the position* for a profit at the higher level. This will likely occur when the option is about to expire. It might make sense to liquidate now rather than risk a move back down to below the up-side break-even point. The critical question is how much further you see the market moving. An expectation of a only a slight climb suggests that the risk/reward ratio is not that hot and that an early liquidation is in order.

The most bullish strategy would be to *liquidate the put* and stick with the long call. The net effect is that you are taking a bullish stance on the market and believe that there is no further possibility of profit on the downside. In effect, you are initiating a new trade at the current price level. You are increasing the profit potential by decreasing the cost of the position relative to a straddle, but you are also decreasing the chances of success. (See Chapter 7 before initiating this strategy.)

A final possibility is to *roll up* the position. You would move the strike up to near the current UI price. You might or might not be able to lock in a profit, depending on the speed at which the UI price got up to the current level and/or the change in the implied volatility.

You are now giving yourself a chance to profit on the up-side, yet leaving yourself protected if the UI price starts to move lower. You should look at this as a new position, which means that you should review the selection criteria given at the beginning of the chapter.

For example, you might not want to roll up if implied volatilities are very high and time decay is large. This is probably the time to bail out of the position instead. Alternately, you could consider rolling out to a farther expiration if the implied volatility is less.

If the UI price rises and you expect prices to remain stable, you could:

1. Hold the position if profitable; or
2. Liquidate the position.

You should *hold the position* only if you are carrying a profitable position. This means that you should now expect the UI price to stabilize above the up-side break-even point. You might also want to hold the position if you look for the implied volatility to move sharply higher. However, be watchful on the time decay.

You may be able to *liquidate the position* for a profit at the current higher level. It makes sense to liquidate now rather than risk a move down to below the up-side break-even point. It also makes sense to liquidate the position if prices are expected to stabilize below the up-side break-even point. The loss will be less if the position is liquidated early than if you wait for expiration. This is the most likely strategy because the main conditions for initiating the long straddle are gone. You thought that prices would be more volatile, but now you are expecting them to be stable.

If the UI price rises and you are bearish, you could:

1. Liquidate the position;
2. Liquidate the call; or
3. Roll up.

You might be able to *liquidate the position* for a profit if prices are outside the break-even points, particularly if implied volatility has increased. It might make sense to liquidate now rather than risk a move to below the up-side break-even point.

A more aggressive position would be to *liquidate the call.* This will give you a long put in a declining market. Your risk will be higher because you will not have the hedge of the long call to protect you against a sharp rally. This is a risky tactic because you are calling for the market to change trend. Nonetheless, your potential profits will be higher than holding the original spread because you will have liquidated the call while it had a lot of premium.

Another strategy is to *roll up* the position. You will liquidate the original straddle and initiate a new straddle using at-the-money strikes. Only use this strategy if the new position makes sense given the selection criteria outlined earlier in this chapter. Pay particular attention to time decay because time has passed since you put on the original position. You might want to roll out to a farther expiration if time decay is a problem, but the original premise for the trade still holds.

Short Straddle If the UI price rises and you are bullish, you could:

1. Liquidate the position; or
2. Liquidate the call.

You might be able to *liquidate the position* for a profit if prices are still within the break-even points. It makes sense to liquidate now rather than risk a move to below the down-side break-even point. However, it is likely that you are losing money at this point, and liquidation of the position is the best defensive strategy to limit further losses.

The most aggressive approach is to *liquidate the call.* This will leave you with a short put. The put will likely be out-of-the-money, so the risk of losing money on the put should be minimal. By the same token, your profit potential is limited to the remaining time premium, which is likely to be very little. This can be an excellent tactic to try to recover some money lost on a short straddle.

If the UI price rises and you expect prices to remain stable, you could:

1. Hold the position;
2. Liquidate the position; or
3. Roll up.

You should definitely *hold the position* if you have profits in the position. The success of the short straddle is dependent on the price being within the two break-even points at expiration. If you have a profit on the trade, then prices are likely to be within the two break-even points.

Stable-price action will help you because you are selling time premium. Your profits should mount as time passes.

You might be able to *liquidate the position* for a profit if prices are still within the break-even points. It might make sense to liquidate now rather than risk a move to above the up-side break-even point. You will have to evaluate the chances of stable prices versus volatile prices. If the position is currently unprofitable, you are probably on the outside of the break-even points. Liquidating the trade now might limit your losses to a smaller amount rather than running the risk of a larger loss later.

An expectation of stable prices means that probably the best strategy is to *roll up* the position. It appears now that your original premise for the trade was correct but you entered a little early. Still, you should examine the new position as if you are entering a brand new position, so consider the selection criteria given earlier in this chapter. Clearly, time decay and implied volatility should be considered.

If the UI price rises and you are bearish, you could:

1. Hold the position; or
2. Liquidate the put.

You should likely *hold the position* if you look for lower prices. The success of the short straddle is dependent on the price being within the two break-even points at expiration. With prices now higher than when you initiated the spread, you need a price drop to help your position. In addition, time decay will be working even more for you.

Liquidating the put is a more bearish approach. You are now saying that the market is not neutral but bearish and you want to jump on the bandwagon. Shifting to a naked short call will keep you on the side of writing time premium, but it will also keep you exposed to risk if the UI price rallies sharply.

Delta-Neutral Straddle Trading

The classic way to speculate on changes in implied volatility is the straddle, usually done in a delta-neutral fashion. Buy an at-the-money straddle with a far expiration if you believe that implied volatility is going higher. Sell an at-the-money straddle with a far expiration if you believe that implied volatility is going lower.

Keeping the position delta neutral and in far expirations will result in a trade that is dominated by changes in implied volatility. (See Chapter 4 for details on how to adjust a position to keep it delta neutral.) The use of a far expiration means that gamma and theta are low.

Typically, the position is rolled to a farther contract when theta and gamma start to increase. The object is to have a position that responds mainly to vega, not any other greeks.

The selection of the long or short straddle is entirely dependent on your analysis of the future direction of implied volatility. You will buy the straddle if you look for higher implied volatility and will sell the straddle if you look for lower implied volatility.

The main follow-up strategy is to keep the position delta neutral. Roll out to a new expiration when theta and gamma start to get high enough to notice.

You have two possible strategies if the UI price moves enough to reduce the vega of the existing position.

1. You can roll up or down the position to restore the vega in the position. Obviously you will have to readjust the long or short position in the UI to bring the position back to delta neutral.
2. You can buy or sell more straddles at the new at-the-money strike price. This will have the effect of adding vega, theta, and gamma to a position that has had these decline due to a change in the UI price.

In either case, the follow-up strategy must be examined as if it were a brand new position. The same selection criteria must apply.

CHAPTER 22

Synthetic Calls and Puts

A *synthetic call* can be created by:

- Buying a put and buying the underlying instrument (UI).
- Buying a call and shorting the UI.

There is no reason to initiate a synthetic put or call if an exchange or over-the-counter (OTC) option exists. A synthetic put or call costs more because of the extra commissions.

On the other hand, it is possible that you have sold short the UI but decide later to limit your risk by buying a call. It might also make sense to buy a call to lock in a profit on your short sale but still allow you some profit potential. Alternately, you might have bought a call, turned bearish, and decided to short the UI. The same kind of situation might exist for buying the UI and later buying a put to limit your risk or help lock in a profit.

Generally, all of the ramifications of a synthetic put or call are the same as for a regular put or call (see Chapter 7 and Chapter 8 for more details). Therefore, this chapter will concentrate on the differences between synthetic and regular options.

EQUIVALENT STRATEGY

An equivalent strategy would be to buy a put or a call. As just stated, buying a regular option will be less expensive than initiating a synthetic option. In addition, the regular option will likely have greater liquidity.

RISK/REWARD

Maximum Risk

The maximum risk of a synthetic option is the maximum amount of money that can be lost. Note that this is essentially the premium of the put. The maximum risk of holding a regular option is equal to the premium; the same can be said of the synthetic option.

Look at the synthetic put as an example. The maximum risk, or premium, is equal to the call strike price minus the UI price plus the price of the call. You buy an OEX 550 call at 5 when the underlying index is at 540. The premium is 550 – 545 + 5, or 10. Thus, the maximum risk of the synthetic put is 10 points.

Break-Even Point

Again, look at the synthetic put as an example. The break-even point is equal to the UI price minus the premium of the synthetic put. In the preceding example, the underlying index will have to trade down to 535 before you split even (545 – 10 = 535). The break-even point for the synthetic call is the UI price plus the premium of the synthetic call.

DECISION STRUCTURE

Selection

The key for this trade is the selection of the exchange-traded option's strike price. For example, selecting an in-the-money call when creating a synthetic put will give greater protection to the short sale, whereas selecting an out-of-the-money call will give the greatest profit potential.

If the Price of the Underlying Instrument Drops

The analysis of the follow-up actions for synthetic options is the same for both the synthetic put and the synthetic call. The following discussion will focus on the synthetic put, but you merely have to invert the discussion to apply it to synthetic calls.

You have two choices if you are bullish:

1. Liquidate the short sale and retain the call; or
2. Liquidate both sides of the trade.

If you expect prices to rally, you could *liquidate the short sale and retain the call.* You will now be holding just the call and will not have the bearish protection and down-side profit potential that the short sale gave you. This strategy is risky because it forces you to call a bottom in the market. In addition, you might not be holding the proper call, given your market outlook. Now that you are bullish, you might prefer to have a more in-the-money call than the one used in your synthetic put.

A second alternative is to *liquidate both sides of the trade* and take your profits to the bank. You can structure a new trade to take advantage of your bullish approach rather than trying to shoehorn your existing call into your market outlook.

On the other hand, if you are looking for the market to drop further, you have four choices:

1. Liquidate the call;
2. Sell the current call and buy a higher strike call;
3. Sell the current call and buy a lower strike call; or
4. Retain the current position.

First, you could *liquidate the call.* Liquidating the call will give you a more aggressive posture on the short side because it will leave you without the protection of the call. The advantage is that you no longer have the cost of the protection, the call premium, to reduce your profits.

A second choice is to *roll up* to a higher strike price for the call. This will reduce the cost of your protection because you will be substituting a lower priced call for a higher priced call. The net effect is that you are increasing your profit potential while decreasing your protection. One positive aspect is that you will be able to take some profits home with you from rolling up to the lower priced call. A major consideration with this strategy is that there might not be as much liquidity as you need to initiate a position in the higher strike call.

The third choice is to *roll down* to gain more protection. In effect, you are trying to lock in a profit by rolling down. Note, however, that this strategy will cost you additional outlays because you are substituting a lower strike call for a higher strike call. This strategy should only be attractive if you are becoming less sure of the future direction or if you think there is little profit potential in the down-side.

The final choice is to *retain your current position.* This retains the protection and profit potential you originally desired and requires no additional capital outlay.

If the Underlying Instrument Rises

You have three choices if you are looking for continued higher prices:

1. Liquidate the trade;
2. Liquidate the short position but keep the call; or
3. Sell the current call and buy a lower strike call.

The first choice is to *liquidate the trade.* This will be the usual reaction to a money-losing position. The question really is whether or not the additional dollar risk is worth the chance that prices will move lower. The higher the remaining premium, the more sense it makes to liquidate the trade and limit your losses.

The second choice is to *liquidate the short position but retain the call.* This is the most bullish of the choices. You will now have the greatest profit potential but the least protection. The protection of the call has been eliminated.

The third choice is to *roll down* into a more protective call. Rolling down to a lower strike price will give greater protection because it will have a greater premium. The unfortunate side is that the profit potential will be less.

If the Option Is About to Expire

If the option is about to expire, you can *roll the option forward* into the next expiration month, using the same criteria used above. In other words, you will know if the UI will have dropped by the time you have to roll forward. Your decision then becomes what to do with the position. Refer to the two preceding sections to trace through the logical process.

CHAPTER 23

Synthetic Longs and Shorts

STRATEGY

It is possible to create synthetic long or short positions in the underlying instrument (UI) through various combinations of options. A *conversion* is a synthetic long position. A *reverse conversion* (or reversal) is a synthetic short position, often called a reversal. A conversion is formed by buying a call and selling a put. A reversal is formed by buying a put and selling a call.

Conversions and reversals are constructed to serve basically two objectives:

1. To create synthetic long or short positions that mimic the price action of the UI.
2. To arbitrage versus the opposite position in the UI.

Another way of looking at conversions or reversals is that they are essentially futures contracts on the UI; that is, they represent the market's estimate of the future value of the UI. As such, conversions and reversals can be used in the same ways that futures contracts can be used. An example is to use the reversal to hedge a long position in a common stock.

EQUIVALENT STRATEGY

Buying the UI is similar to a conversion; shorting the UI is similar to a reverse conversion. There will be a big difference between the two strategies only if the UI pays dividends or interest. For example, you will have to pay dividends if you are short stock but not if you have a reversal.

There is no equivalent strategy to the arbitrage.

RISK/REWARD

Conversions or reversals as substitutes for long or short positions have identical risk/reward profiles to their nonsynthetic brethren.

The rest of the this section will deal exclusively with the use of conversions and reversals in arbitrage.

Maximum Profit

Conversion The simple maximum profit for a conversion equals the strike price plus the call price minus the put price minus the UI price. However, carrying charges are important when discussing conversions, unless you will not be using margin or unless the UI does not pay dividends or interest. They will have a major impact on the profitability of the trade.

Note that you have locked in a profit at the outset of the trade. Presumably, your only concerns after entry will be unanticipated changes in the carrying charges. For example, there may be a cut in dividends or a rise in financing costs.

Reversal The simple maximum profit for a reversal equals the UI price plus the put price minus the call price minus the strike price.

The carrying charges are also critical in calculating the maximum profit potential. A reversal requires the payment of dividends or interest payments.

Break-Even Point

As a trade, there is no break-even. Subsequent price action is irrelevant to the outcome of the arbitrage.

However, change in carrying charges will affect the outcome of the arbitrage, and a break-even point could be identified for each of the components of the carrying charges. For example, you will make money if the dividend payout stays at 5 percent, but you will lose money if the dividend moves below 2.5 percent. Thus, 2.5 percent on the annualized dividend yield becomes your break-even point.

Maximum Risk

The maximum risk for an arbitrage will not be related to price but to changes in the carrying charges. As was mentioned earlier, the carrying charges are working for you or against you. They become the major determinant of profitability once you are in the trade.

The only outside risk is the risk of assignment on the short option. As the short option moves further into the money, you might want to try to roll strikes closer to the at-the-money options.

DECISION STRUCTURE

There is no decision structure that is similar to that of the other strategies in this book. Instead, the decision structure is very simple.

You will initiate an arbitrage only if the difference in price between the actual instrument plus the net carrying charges minus transaction costs equals a profit. Once again, the key to the arbitrage is the carrying charges. They must be calculated accurately and monitored closely.

There is no follow-up action to take unless the carrying charges are changing against you. At that time, you should liquidate the trade to limit losses.

CHAPTER 24

How to Make Money Trading Options

The good news is that there are many ways to make money trading options. The bad news is that most traders lose money trading options. Let's try to shift you out of that second category.

It is common knowledge that about 90 percent of all options traders lose money. About 5 percent break even and 5 percent make money. I believe that the main reasons are psychological and a lack of capital leading to poor risk management decisions. Let's look at these critical issues.

There are three keys to making money trading options. They are:

1. The psychology of investing.
2. Controlling your risk.
3. Getting every edge in your favor.

In fact, you will not be a profitable options trader without a full understanding of these three factors even if you have a complete understanding of everything else in the book. The reason is that the information in this book is intellectual knowledge. I'm sure you have the capability to understand it. But the three issues above are behavioral skills, not intellectual knowledge. As a result, they deal with your particular psychology or character. Character is much harder to control and/or change than the simple learning of a new skill. This chapter is critical to your success as a trader. Don't pooh pooh it because there is virtually no discussion of options here. This is far more important.

THE PSYCHOLOGY OF INVESTING

The most important factor that determines investment success is the psychology of the investor. It is not what strategy you are using. It is not what quote system you are using. It is not how much money you have in your account. It is you.

What good is a good strategy if you don't follow it? Or what if you bail out early? What will you do if you have three losing trades in a row?

I did a series of speeches where I asked options and futures traders whether or not they had consistently made money over the previous two years. Few had.

At first this perplexed me. Clearly the people who came to these conferences had some money. They had to fork over $500 to attend the seminar. They probably had to spend another $500 on hotel, food, and transportation. These people were clearly not indigent. It seemed to me that the majority were successful doctors, lawyers, and entrepreneurs. Yet they were not successful as traders. Why not?

WHY DO YOU TRADE?

First, I asked them why they traded. They answered that they wanted to make money. I asked them if they were really sure. By this time they were starting to second-guess their first answer. But, in the final analysis, they stuck with their answer that they were trading so that they could make money. I think that that is completely wrong. I think that people trade for tons of reasons and making money is a relatively minor one.

Nobody really knows why each individual person trades but there are many reasons other than making money.

I first discovered this about 20 years ago. Back in the 1970s, I managed futures money with a partner. We offered two different accounts to our prospective clients. The first account traded only commodity spreads and was making 200 percent per year while the second account traded only outright positions and was making about 100 percent per year (please note that these returns were so high because I didn't know as much as I do now about risk and money management and we were simply taking far too much risk).

Of course, everybody opened up a spread account because it was making 200 percent per year. Within six months, nearly everybody had shifted their account to the outright program in spite of the fact that it returned only half as much! This stunned us because we always assumed that people invested in futures to make money. In fact, they were involved for the action. They would call us up when they were invested in the spread account and ask how their account was doing. We would respond that they made $12.50 the previous day because a back spread in the corn market had moved $^1/_4$ of a cent!

On the other hand, they would call about their outright account and we would say that the value of the account had moved $1,000 because of some big move in the bellies.

The point is that they wanted the action of the markets not the profits. Their primary motivation was action and making money was secondary. It's all right to pay to see a movie because of the entertainment value. To them, losing money trading was the price of admission to a fun and exciting game.

This was my first clue that making money is secondary with many people. In the case above, the clients were more interested in the excitement of trading than in the making of money. They wanted to feel that jolt of adrenaline that comes from trading. They liked the high of having the account value go up and perhaps even liked the adrenaline hit that comes from losing money.

In my lectures, I ask people how they feel when they have bought a market and it is moving strongly higher. People in the audience said that they felt great; they felt high! And they said that they felt terrible when they were losing money.

It is common for people to call the options market Las Vegas on Lake Michigan. People know that they will lose money when they go to Las Vegas and yet they still go because of the excitement and entertainment they receive. Except for card-counters in blackjack, nobody goes to Las Vegas to make money. Nobody plays roulette with the idea that they will make a lot of money or will be able to make a living doing it. They do it for the excitement. The fact that they *might* make money is the motivation.

Many people trade to provide a diversion from their regular life, perhaps because they feel that it is boring or not stimulating enough. They call their bookie or they call their broker because it beats sitting at home and watching TV. A lot of people now play online poker to get the same effect.

Another reason that many people like to invest in options is because they like to solve the puzzle of what makes the market go up and down. They want to be able to predict the market.

Notice the fact that nearly all articles and books written about trading are about entry and exit techniques. Yet trading techniques developed by Richard Donchian in the 1960s have been shown to make money for every year since then. We already know what techniques make money yet 90 percent of traders lose money! To me it is clear that it is more important to continue to figure out what makes the market tick or to figure out new entry and exit techniques than to make money. Rather than use the old tried and true techniques and make money, they prefer to try to figure out new techniques!

There is a common desire to want to figure out puzzles. The market is a very challenging puzzle and attracts many people who want to solve it. They are fascinated by the puzzle and they want to find a new way to beat the market.

Many traders believe that there is an underlying truth to the market or perhaps a powerful underlying pattern or force. They therefore believe that they should spend a tremendous amount of time trying to understand that underlying force. For example, many people spend many hours or even days trying to understand Gann or Elliott on the assumption that if they can just crack the code they will become rich beyond their wildest dreams. Or if they just study harder they will understand the teachings of the guru that they are ascribing to.

These traders focus on trying to unlock the secrets of the universe as the way to make money rather than going directly to the subject of making money. They end up spending a tremendous amount of time on the study of esoteric theory and not on trading the markets. When they do trade the markets, they often stop trading after just a few losing trades because they assume that they do not understand the secrets of the universe well enough and should go back to studying.

Take a look at the popularity of literature and lectures about trading systems. The basic concept behind trading systems is that there is a mathematical model that will create profits. I agree that this is true. The continuing success of Donchian's basic systems, mentioned earlier, shows that trading systems can make money.

However, many people like to invent their own systems or modify other systems that they have purchased or read about. One problem with this is that they spend all their time trying to perfect the system rather than make money. They often become obsessed with fine tuning their system rather than simply using an imperfect system. Of course, no system is perfect so they end up spending all their free time on the system instead of making money. The perfection of the system becomes much more important than the point of the system, which is to make money.

In the mid-1990s, I had the opportunity to train traders from Korea. I had six months to turn them into profit-making traders. They each had $100,000 to trade. I had three groups of six traders for each six-month period.

I decided to give the initial six trainees a liberal arts education about trading. I taught them everything about trading under the sun. I even had guest lecturers teach them about subjects that I was not expert in, like Elliot Wave.

One of the guest lecturers was a good friend of mine who was an Elliot Wave fanatic and had been trading using Elliot Wave for about eight years. I left the room while he gave the lecture. At the end of the lecture, I came back in and started to ask him some questions about his trading that I thought would be informative to my students.

I asked him point blank, "Why do you use Elliot Wave?"

He said, "There is no greater feeling in the world than to have analyzed the wave structure of a move and to buy right at the absolute bottom of Wave Two!"

Then he jerked his thumb toward me and said to the students, "It's so much better than trading the boring way that Courtney does!"

I use many of those tried and true trend-following techniques and my techniques never allow me to buy the bottom of any move. The point of this is that my guest lecturer was far more interested in being right than making money.

This is one of the critical concepts necessary to become a profitable trader. You must focus on making money, not on being right. In fact, analyst Ned Davis once wrote a book called *Being Right or Making Money*. Notice that he didn't say "being right AND making money." To both of us, trying to be right is often a block to making money. It means that your ego is wrapped up in the outcome of the trade and you will therefore have the tendency to want to hold onto losers longer than you should. They will become larger than they should for you to have trading success. You will not have cut your losses short. In addition, you will take off winning trades quickly, with only small gains, because taking a profit will vindicate you and show that you are right. Having a winning trade is a way to validate themselves and make them feel good about themselves. It shows them that they are smart and clever because they were able to peg the market.

Trying to be right also creates a tendency to cause overanalysis of a position. Some traders will so overanalyze a position to make sure that they are right that they end up missing the move. They were never wrong but they didn't make any money.

There are also many people who trade options because of the image that it projects. Option traders are sometimes thought of as rogues to some people or sophisticates to others.

There are people who like to discuss their speculative adventures to their friends and associates or at parties as an image enhancement tool. They want to show off their knowledge or to project a certain image. It sounds much more impressive to people if you are sitting around talking about your last trade in the options market than what you normally do for a living.

A final common reason for trading is pure greed. I am differentiating between trying to make money and the greed that is trying to make a big score quickly. You go to your job every day to make money but you buy lottery tickets to make the big score. Trading to make money is different than trying to make scads of money quickly. It is this type of greed that attracts people to those commercials on the radio and TV that suggest that you can make huge profits in just ten minutes a day. It is this greed that fuels the ads in other options publications that show guys on the beach with their cell phone and a pina colada trading options pictures or posing in front of their Rolls Royce.

There are few endeavors where you can make millions with just a small investment and trading options is one of them. There is no question that the dream can come true in options trading but, realistically, it never will. And the ways to achieve it being touted by options trading promoters are certainly not the way to do it. Still, there are many new options traders who trade options to make a big score quickly.

Interestingly, there are also a lot of traders who believe that they can get rich slowly by consistently selling options premiums. They have heard the statistic that 70 to 80 percent of options expire worthless. They have heard that a lot of options trading professionals generally are sellers of premium rather than buyers of premium. I have invariably found that they have the attitude that they should mimic the "insiders" and just take money from the suckers. And that kind of attitude is not conducive to profitable trading.

WHY DO YOU LOSE?

It is important to understand why options traders lose so that we can avoid those problems in our own trading. In my lectures, I often ask the audience to tell me why they lose money trading. I am always fascinated to note that they know exactly why they lose. Let me repeat. The audience knows exactly why they lose.

I suggest you stop reading right now and write up a list of reasons why you lose. Go on, stop reading!

They quickly jump up and list off the reasons why they lose while I write them down. Let me show you the list from my last lecture:

Overtrading

Greed

Not following system
No system
Too tight stops
Lack of understanding
Too emotional
Not paying attention
Lack of time
Going against pros
No goal
Lack of plan
Lack of confidence
No analysis of mistakes
Lack of capital
Compulsion to trade
Preconceived ideas

Sound familiar? I would imagine that you can find the reason why you don't make money somewhere in that list. I know I can find the reasons why I have gone through losing streaks.

Typically, the audience is firing these reasons at me so fast I can't keep up. It is always clear to me that they have thought about why they are losing and have a pretty good idea.

I think that this list can largely be grouped together into three major categories: lack of self-discipline, lack of knowledge, and lack of capital. Some of them fall into two categories. I can't really say that where I placed each of these reasons is the final word. Some of these reasons flow between different categories. I think that not having a plan is probably a combination of a lack of discipline and knowledge but others might argue that it is simply a lack of either of these separately. But, ultimately, how the reasons for losing are categorized is almost irrelevant because what we really want to do is focus on the three main categories and how to deal with them. They are a lack of self-discipline, knowledge, and capital. The latter two are probably the easiest to deal with and lack of discipline is usually the hardest. Why? Because it involves a change in your character. Money and knowledge can always be acquired but changing one's character is usually extremely difficult.

Let's talk first about the two lesser problems before going to the issue of self-discipline. I think you will soon see that self-discipline is the real key to success in trading because it permeates even the two other problems.

LACK OF KNOWLEDGE

Frankly, this is the easiest of the three main problems to solve. Knowledge can be acquired in many ways:

Reading books (like this one!)

Reading magazines

Attending seminars

Attending classes

Finding a mentor

Swapping information with a friend

Watching video tapes

Just do it! It doesn't really take money to learn. A subscription to a magazine is inexpensive, books are often even cheaper and a library card is free.

Virtually all the knowledge you need is available for free at the library. The Internet also has a tremendous amount of free information. You don't need to go to a $3,000 seminar to learn all you need to know to make significant profits trading.

First, you need to know the basics, such as contract specifications, what is a long and short, and so on. Second, you need to know some entry and exit techniques if you use technical analysis and you will need to know something about the underlying instrument if you are going to use fundamental analysis. In many respects, that's all you need to know. The intellectual knowledge to profitably trade options is trivial, far less than what you know about your job.

This is not to denigrate the value of knowledge, particularly when trading options. Options are the most complex instrument to trade, far more complex than stocks or futures, but knowledge can be easily gained. I believe that this book will give you all the intellectual knowledge you need to be a successful options trader.

Take another look at the previous list. You can see that the lack of knowledge is not really a lack of knowledge relating to the intellectual knowledge necessary to trade but is, instead, related to the psychology of trading.

Now take a look at the following list:

No system

Lack of understanding

No goal

Lack of a plan
Lack of confidence
No analysis of mistakes
Preconceived ideas

Only the first two are really a lack of intellectual knowledge, the rest are a lack of psychological knowledge. In fact, you can see that the vast majority of the items on the list are really related to a lack of self-discipline or a clear lack of focus.

Yes, of course it is good to be constantly learning more about trading. The more you know about trading or markets, the more likely it is that you will make money.

However, you can see that few people realized that they needed to know more before they could make money. The lack of knowledge is really the lack of knowledge about oneself or of one's own trading.

In general, you can see that the list is really a list of psychological failures. It is a list of things that could create a profitable trading plan that are not being done. Once again, the audience knew what the problems were, but were apparently helpless to do something about it. They knew they had no goal, plan, and/or confidence but hadn't done anything to correct this potentially fatal flaw in their trading. Why not? I believe that the answer lies first in the discussion of why people trade. Perhaps making money is not their priority. This is likely where the problem lies. But let's assume that this is not the case and that they really are motivated to make money trading options. In that case I think that the problem is a lack of self-discipline. Once again, they know the problem but have not conquered it. Solving these kinds of problems requires an insight into the problem, a plan to solve the problem, and the self-discipline to apply the solution.

Clearly people have an insight into the problem or they wouldn't have listed it. That means that they now must have a plan and the self-discipline to put the plan into place. It is beyond the scope of this book to come up with a plan for each of these problems. However, the issue of self-discipline will be dealt with in great detail later in this chapter.

LACK OF CAPITAL

A lack of capital means that you are overtrading and risking too much of your capital on each trade. The lack of capital may be the easiest of all the problems to solve. You must either raise more capital or risk less on each trade.

The first solution obviously requires you to both earn and save money or to allocate more of your current assets to options trading.

The second solution is very easy to do as well. However, the problem comes when your account is very small, such as under $10,000. It's easy to find lots of interesting trades when your account has $250,000 but much harder when you only have $5,000.

We will discuss risk management in more detail later in this chapter. For now, let's assume that you risk 1% of your equity with every trade. This means that you can only lose $100 on each trade if you have $10,000 in your account. Clearly, there are few trades that you can enter into and only risk $100.

There are several solutions. First, save and invest more money. The more money you have in the account the more you can risk per trade. For example, using a 1% bet size, you could risk $200 on a $20,000 account, $500 on a $50,000 account and so on. There are obviously a lot more trade opportunities when you can risk $500 than when you risk $100.

A second alternative is to risk more per trade. For example, risk 2% or 3% of your equity on each trade. This will give you many more opportunities to make money but will increase the risk of ruin.

Sometimes this is the only alternative. You take more risk than you should in order to play the game. However, the greater the risk you take, the greater the chance that you get wiped out. It's sort of like "double or nothing." On the other hand, prudent money management means that you are much more likely to succeed and that you are treating trading options like a business.

Do not take this issue of bet size too lightly. I think that it is one of the most important issues there is in trading options.

I recently had a meeting with a gentleman who was very proud of his foreign exchange trading track record. He said that he had tripled his $1.5 million in the first quarter of this year. I told him that I was duly impressed but asked him how long he had been trading. He replied that he had just started at the beginning of the year. My enthusiasm shrank considerably.

Of course, I was still impressed with him tripling his money but had to ask the obvious next question, "How much of your bankroll do you bet on each trade?" He casually replied, "I like to keep the risk to a third or less of my capital." My jaw dropped. I literally couldn't believe my ears. Did he just say that he bet a third of his total bankroll on each trade? I had to ask again and he stated that this was the case. He seemed proud of his conservatism!

Well, I can tell you that he is guaranteed to be wiped out! There is no way that he will go long before he has three straight losing trades. I know that I have that many every year!

The point: you can take a greater risk than you prudently should but you are also increasing your risk of ruin. A lot of people mistakenly think that they can't trade options and only risk a few hundred dollars per trade. They think they need to risk at least $500 per trade and, more likely, $1,000 per trade, to make money. In general, I think that this is true.

However, there are two possible techniques that traders can use and keep the risk per trade to just a few hundred dollars.

The first is to trade spreads. Spreads have their own pitfalls but offer many opportunities to develop trades with minimal risk. You should make sure that you are familiar with spread trading before going that route to make sure that you don't fall into any of the pitfalls.

Alternately, you can buy a more expensive option but stop yourself out when the premium declines by a few hundred dollars. Finally, you can construct option strategies, such as call or put spreads, which have risk limited to just a few hundred dollars.

You can buy out-of-the-money options that are worth only a few hundred dollars. The advantages are that you are risking only a small amount of money and that you can't be stopped out prematurely. The disadvantage is that you will likely have fewer winners because the price of the underlying instrument will have to move significantly before the option is in the money.

Options strategies, such as put or call spreads, might be the best bet. With a call or put spread you have limited your risk to a few hundred dollars, yet have increased your chances of having a winning trade. What you have given up is the possibility of a major winning trade. Of course, there are follow-up strategies that can increase the profit potential if the market moves in your favor.

Note that options are a very powerful tool for keeping risk down to a few hundred dollars per position. The bottom line is that lack of capital is probably the easiest problem to solve.

Now let's tackle the hardest.

LACK OF SELF-DISCIPLINE

This is the biggie.

In my opinion, this is the main reason that people fail at trading. Almost every reason that people give for failing has a tie in with lack of self-discipline. Plans, goals, systems, techniques, and knowledge are all useless if there is no self-discipline to apply them.

Everybody seems to agree that self-discipline is the key to options trading success. But no one shows you how to achieve it. I will attempt, in this book, to provide techniques for boosting self-discipline and your options trading profits.

In my career, I have hired many people to be traders for me. Many had little or no experience. I always looked on their resume for some indication that they had self-discipline. Had they been in the Marines or other armed forces? Had they been heavily involved in sports or gotten a degree in something like engineering, math, or physics? All of these are indications that they may have a lot of self-discipline.

It has been my experience that Marines and athletes are represented far beyond their normal representation in society by the numbers of successful traders. Why? Because it takes a tremendous amount of self-discipline to be successful in these two areas.

Notice that I do not look for people that know a lot about options trading or have MBAs, although it is preferred that they have some knowledge of options. I can teach the intellectual knowledge necessary to trade but it is much more difficult to teach self-discipline. However, that is exactly what I hope to do in the rest of this section.

Unfortunately, self-discipline is not something that can be taught. It has to come from within. Nobody can create self-discipline for you. This sounds reflexive but you must have self-discipline to acquire self-discipline. To a certain extent, this is true.

This book will not teach you self-discipline; only you can do that. However, it is often possible to pick up techniques or tricks that can boost your self-discipline. You may find some of the following techniques provide the impetus toward self-discipline. Some may work for you and others will fall flat.

I have used all of them myself with success for both myself and in my teaching others to be successful traders. There is no magic in them. They are simply techniques for trying to enforce self-discipline in trading options. They are designed to help you become a better trader. Please note that I am outlining a technique. You can change them to fit your own needs and desires. Take these ideas and make them your own. They will work better for you that way.

THE BIZARRE TWISTS OF THE MIND

It's amazing what tricks the mind will play. It's as if you don't really want to make money and manage to find some very strange ways to lose money. A good friend of mine is a perfect example.

He is arguably the smartest person I know. He is extremely intelligent and is very knowledgeable about many subjects. He decided that he wanted to be a professional trader. I showed him some techniques and he took them to another level and created his own mechanical methods. He got his quote screen all set up and was ready to trade.

I helped him out by enabling him to open an account at the same broker that I used. Normally, the broker only handles institutional accounts but he decided to allow my friend to open an account with only $10,000 as a favor to me. He also allowed him to trade at institutional commission rates that are roughly half those charged by retail brokers.

He then proceeded to lose about 60 percent of his bankroll over the next six months. This was a terrible track record since it meant that he was losing consistently because he was able to keep his risk to below a couple of hundred dollars for each trade. That means he had a lot of losing trades. It was quite remarkable because the system he was trading had very little discretion and had such a tremendous track record while being tested. He went back over the track record of the system during the time that he was actually trading it. Turns out that he had lost 60 percent but the system was profitable. In other words, he was not actually following the system. He was not executing the trades according to the signals.

It turned out that he was intimidated by calling an institutional broker and only putting in a one or two lot order. He felt that he was wasting their time since they were used to dealing in larger quantities and that they were doing it only as a concession for me. The brokers had never complained but my friend had projected a problem where none existed. He would hesitate before entering a trade and end up missing many trades and creating a huge slippage problem.

The solution was obvious. Shift his account to a retail broker that charged twice as much and gave poorer service!

By shifting his account to a retail broker, he felt that he wasn't bothering anybody and could go back to focusing on the market instead of his relationship with his broker. He was getting worse fills and paying twice as much in commissions but was starting to make money. He had found a bizarre little problem in his mind that was stopping him from making money. The good news is that he could easily solve the problem.

EGO

Why do we lack self-discipline? No one can say for certain but I believe that our ego is the primary cause of a lack of self-discipline. We need to validate ourselves and show that we are a good person. Our ego has huge needs that get in the way of trading success.

I'm not saying that the ego is all bad. On the contrary, we need to have a strong ego to trade again after being beat up in the markets. We have to feel strong enough to take the psychological pressures of trading and keep going. But the ego is also likely the cause of nearly all long-term trading losses, in my opinion. It's not natural to trade. We have to overcome our ego to be successful yet still allow our ego to motivate us to make money. We are constantly trying to find the fine line between humility and egomania.

THE PRESSURES OF TRADING

The pressures of trading are extreme. You feel elation when you have a big winner and depression when you have a big loser.

Unfortunately, these emotions are the enemy and you've got to overcome them. Many of the most successful traders that I have known have ice water in their veins. They remain cool and calm no matter what good or bad events are swirling around them.

Legendary futures trader Richard Dennis stated that trading is almost against human nature. We have met the enemy and it is us.

Much of the issue of self-discipline is finding ways to overcome our natural impulses driven by fear and greed and the other motivations outlined in the beginning of this chapter. Perhaps we need to distract ourselves from what is really driving us, to something more manageable that we can control.

The pressure of making and losing money creates a lack of objectivity that clouds your mind and therefore creates dubious trading ideas. The first goal is to reduce these pressures and help us to become calmer about our trading.

TREAT TRADING AS EDUCATION

Rather than think of trading as a means of making or losing money, think of what you can learn from each trade and from trading in general. Think of trading as going to university but with a pop quiz every day.

Focus on what you are learning as you go through the trading experience. Every time you exit a position, look at the trade and try to identify what you learned rather than how much money you made or lost. Did I analyze the commodity correctly? Did I understand the driving forces that caused it to move? What should I learn before my next trade? Did I follow my plan? Did I enter the trade well? Did I exit the trade well? What were my emotions while I entered/exited the trade? What could I have done better? What did I do well? What did I do poorly?

This should give you an idea of the questions you can ask yourself to further your education. The point is to focus like a laser beam on learning, not on your profit and loss.

Normally, people focus on how much money they have made or lost. But, in a way, that is irrelevant. Money will be made or lost on every trade. The real issue is whether or not your bankroll is increasing over a longer period of time, say a month, a quarter, or even a year. It is highly unlikely that you will make money over the long run if you do not constantly improve as a trader, particularly if you are not currently a profitable trader.

I have been a professional trader for about 30 years and have had only one year that was even close to a losing year. But I still spend a tremendous amount of time trying to improve my craft. I bought the trading journal *Commodity Traders Consumer Research* in 1996 from Bruce Babcock. One of my primary reasons for buying it from him was that it gave me the opportunity to interview and learn from some of the best minds in the options industry and also allowed me access to books, systems, and other products so that I could learn more.

If I do not constantly strive to learn then I will be caught when market conditions change. I used mechanical trading systems extensively back in the 1970s and 1980s. I got very nervous about the efficacy of them in the late 1980s when I saw Mint (a very large commodity money manager) acquire $1 billion under management. They were the first to achieve that amount of money. They used a standard trend-following method based roughly on a 40-day moving average.

I felt that if there was a company with a billion dollars under management then that particular style would find it very difficult to make money–it had so much buying and selling power that it was the market. It would dominate the market so much that it would not be able to make money. There would not be enough liquidity in most markets to allow them to diversify.

Remember, Mint was only the tip of the iceberg. They had a billion dollars but there were lots of other plain vanilla trend followers in the market at the same time. After all, I was one of them. I wasn't doing anything special in my trend-following systems.

I felt that the returns to trend-following systems would degrade because there was too much money flowing into the market all at the same time and that would mean that the profits from the system would not be as high as they had been in the past. I decided that I would have to change my method of entry and exit. I use fundamentals to determine the direction that I want to trade in and use mechanical systems for the entry and exit. If mechanical systems were being overused then I would have to learn an entirely different method of entry and exit. I ended up switching to a classic chart analysis method.

It turns out that trend-following systems did, in fact, go through a period of poor performance. (I think that the amount of money under management of trend-following systems has been reduced, as a percentage of the total amount under management, and that trend-following system will again produce good results.)

The point is that I had to be alert to the fact that what I had been doing may not work in the future and I had to learn a new skill or I was out of business. I had to make sure that I had backup skills in case my current skills were no longer being rewarded by the market.

Conditions change—make sure that you are prepared for it.

A focus on constant learning is essential if you are going to be in this game for a long time. Market conditions change and you must be alert to those changes and have a depth of knowledge to draw from if you need to change your trading strategies or tactics.

I believe that trading success is built on the excellent execution of a few fundamentals. You don't need to get fancy, just focus on the basics. I think that you will find that most of your losing trades come from breaking a few fundamental rules, such as not placing and sticking to a pre-set stop loss level.

Switching the focus onto learning and away from profits and losses helps to reduce the emotions associated with trading. You can look at each trade much more objectively because you almost don't care if you made or lost money. In a curious way, you might even "enjoy" losing trades more than winning trades because you can usually learn more from the losers!

Notice that this orientation helps to promote good trading practices. Remember, you should be noting everything you did right in the trade as well as what you did wrong. This will reinforce behavior that produces profitable trades.

In a way, the definition of a "good" trade changes. A good trade becomes a trade where you learn something new, not one that makes money.

Notice the powerfully different mindset between these two directions. Making or losing money on a given trade becomes no big deal. Instead, you try to dispassionately analyze your trading to see how to improve. You are almost forced to be objective. The flip side is that a tremendous pressure will be released. You are no longer judged (by yourself) by the success or failure of your last trade. The pressure is replaced by the pressure to improve as a trader. That is a much nicer pressure to feel and will lead to better trading and more profits. It is much better to kick yourself for not learning as much as you could than to kick yourself for losing more money. You will be motivated to study your trading rather than feeling sorry for yourself or angry with yourself.

Focusing on your own trading will also tend to keep you from relying on others for your profits. It is possible to use systems and ideas from others but you will never learn anything. In the final analysis that is OK but few people have the self-discipline to simply follow a system. Most people want to have some input into the trading decision. This ties back to the ego problem.

The bottom line is that changing your focus from making money to constantly learning will sharply reduce your stress level, keep you focused on learning how to make more money, and increase your self-discipline.

Notice that you can divide those answers into several categories. Most of the responses fall into the category of discipline. I have found that the trader's discipline is the most important factor driving trading profit. Discipline comes into play in several different ways.

First, you have to be disciplined in your trade selection. It is a common mistake for traders to talk themselves into a trade rather than keep themselves objective about the factors supporting or not supporting the trade. A trader will often approach a trade with a preexisting bias and then find evidence and factors to support this bias rather than come to the trade with an open mind.

Second, you have to stick to your plan. Let's say you are running a program of covered calls. Often traders will stop trading when they have a few losers in a row. They will begin to doubt their strategy and, even worse, themselves. They will think that the strategy is defective. Perhaps the software they are using is no good. They stop trading and start to tinker with the strategy. Perhaps they should only do covered calls with in-the-money options so there tends to be more down-side protection. Perhaps I'm not a good trader. Perhaps I should double up my positions to catch up on those last few losing trades. Perhaps I should just stop trading because I'm not a good trader.

Casting doubt on your strategy or even on yourself can be wise. But it usually happens after just a few losing trades. Instead, traders must stick to a strategy until there is a significant number of executed and closed trades. Only then can a rational course of action be created.

One of the critical psychological factors that drives investment success is being consistent and persistent. This means that we do not constantly shift strategies or tactics. It means that we continue to probe the market looking for opportunities to make money. It means that we don't bail out of a strategy just because it has a bad run of losses.

I have taught many traders how to trade and I see this as one of the most common problems for traders. They read a book, such as this one, and become enthralled with the idea that they can make a lot of money trading options. In fact, you can make a lot of money trading options. However, it is not easy. Traders begin their trading with eagerness and high expectations. Then the hard reality sets in that not all trades will be winners and not all winners will be big winners. Or they start out with idea that they can be consistent sellers of premium so they have a few winners and then the inevitable demoralizing big loser comes in.

They then throw up their hands and flinch. They may stop trading entirely or they may start to take just some of the trades. They may start to override their original strategy and only take trades "they think will do well." Of course, this is doomed to failure. What will happen is that they will inevitably pick the losing trades and ignore the profitable trades. Perhaps I'm being cynical but I've seen it happen too many times to not expect it. Of course, this just leads to more frustration, more losses, and finally they throw in the towel mumbling something about how the game is rigged or something similar to throw the blame onto someone other than themselves.

Another common example of the effect of psychology dominating trading is the common action of taking a profit before it was planned. Commonly, the trader has had a run of bad trades and finally has a position that starts to make money. They were originally planning to make $1,000 on the trade but the temptation of booking the current $300 profit proves to be too high. They override their original strategy under the influence of finally having a profit.

I've often heard from traders that you can't go broke taking a profit. In fact, you can. There are always going to be losses in a trading program. Profits at the end of the year will depend on whether or not there are enough profits to cover those losses. Cutting profits short of their potential is a sure way to create a losing program at the end of the year. Sure, the trade will be profitable but the program will be a failure.

Another common strategic mistake is to bail out of an existing position when some news item breaks. They immediately jump out of the position, particularly when the position is starting to go against them. They rationalize that the news item changes their strategy. On the face of it, this seems sensible. Surely we should be able to enhance our profits if we take into account the freshest information rather than relying on the stale information that we had when we first put together our plan for this trade. Actually, traders tend to do worse when they override their original plan and change it in midstream due to a news item. I did an informal study of the professional traders that I was managing to see if this was true. It turned out that following the original plan was more profitable than the new trade over 80 percent of the time. This shocked me. Why would traders do worse having current information compared with sticking to what should be an obsolete plan?

I think the answer comes from several directions. The original plan was made in a cool and calm state of mind. The new plan is made under pressure and under the gun. The original plan was derived after careful and objective consideration of the facts. The new plan is made after instant analysis of perhaps only one new fact. I believe that this study shows that traders have a very hard time properly evaluating new information under pressure and when they are emotionally involved with the current trade. Instead, they are better off sticking with the original plan.

THE TRADING PLAN

Perhaps the most powerful technique for increasing self-discipline is the use of a trading plan and the attendant post-mortem technique. I am going to go into more detail about this technique and will show real examples of a trading plan.

A lot of the losses come from making stupid mistakes. You forget to put in the stop because you will do it tomorrow. You don't know the right contract size. You like the way the stochastics are acting but completely ignore the breakdown on the chart. And so on. In other words, you simply forget to take a look at something that you know you should look at.

I think that the two main reasons for not paying proper attention are:

1. Too busy a schedule or simply not caring.
2. Not wanting to confuse your opinion with facts.

I firmly believe that the consistent use of a trading plan will overcome these problems. I also believe that the trading plan is the second most important part of a trade, after money management. The actual entry and exit techniques are secondary. Most traders will find this statement hard to accept but most profitable traders, even if they do not use a trading plan, will agree with me. And there are several reasons why.

Without proper monitoring, you will drown in a flood of information. With a trading plan, all the relevant fundamental and technical indicators can be stored in one spot. It will allow you to outline a scenario of expectations for the future. In addition, it provides a place for the exact entry and exit points to be delineated and necessary money management principles to be applied.

One of the important features of the trading plan is that it be devised before the money is risked. Traders are typically far less emotional about a trade before the money is committed. Typically, traders lose their objectivity when their money is on the line.

The trading plan also helps to educate you. After a trade, you can go over your trading plans and what actually happened. This is called the post-mortem. You have an opportunity to examine how accurate the pre-trade analysis was and discover areas of weakness in your own education or insights. Often, investors will realize that certain facets of their trading technique have been over- or underestimated. They think that a particular technique is doing well, when, in fact, it is doing poorly. Traders can refer back to the trading plan to determine whether things are going as planned and whether there have been significant changes that will affect the analysis that led to initiating the position. The trading plan thus becomes a rudder for the average speculator, who tends to trade like a rudderless ship. When investors are forced to commit thoughts to paper before initiating the trade, their thoughts must be more logical and coherent. A record of your thoughts before the trade was initiated provides a useful insight for future growth.

The use of a trading plan is also a viable way of reducing mental fatigue and anxiety. The trading plan is a record of the thoughts of the trader before the trade is initiated. It represents a more calm, detached state of mind than will exist when money is on the line. Traders who have committed money based on a rational trading plan will be able to refer back to that trading plan and use it as a touchstone of calm.

FILLING OUT THE PLAN

Many people believe a trading plan is a waste of time. Filling out a trading plan does take time but is probably a major time saver in the final analysis (see Figure 24.1). Most average speculators will spend a tremendous amount of time and energy watching the market on a tick-by-tick basis. This seems to be based on the psychological concept that if they do not watch the market it will go against them. This constant staring at a screen is an incredibly time-consuming activity. There is a major loss of energy when a trader's mind is unfocused and the trading plan enforces a certain discipline, requiring that traders specify the entry and exit points and the method of stop placement before the trade is initiated. This means that traders can enter entry and exit points once a day rather than staring at a screen all day long looking for clues to the future direction of the market. The plan will reduce impulsive behavior by traders when prices get close to entry or exit points. There are often nagging second thoughts about a trade when prices begin to get close to the entry point. This doubt is really a form of self-doubt and often occurs when traders are not using a plan. The use of a trading plan releases traders from having to watch the market on a micro-level. The time saved can be spent analyzing the markets and acquiring more knowledge.

Remember, the main point of a trading plan is to help increase discipline. A written plan is far superior to a mental plan. It is extremely difficult

Investment Mentoring Institute
Options Trading Plan

General
Date__________________ Underlying Instrument Symbol_____________

Underlying Instrument

Bullish/Bearish?:__________
Price Scenario: ____
____
____

Options

Implied Volatility: Bullish/Bearish____
____
____
Other Considerations____
____
____

Strategy Action Plan

Initial Trade
Strategy:____
Initial Entry Technique:____
____
Commission:_________________________Margin:________________________________
Initial Stop Loss____
Initial Stop Loss Technique____
Follow-up Strategy ____
____
Notes:____
____
____
____
____

FIGURE 24.1 Investment Mentoring Institute Trading Plan

for the human mind to take into account all possible factors in a rational manner when they are not written down. A mental trading plan tends to become a plan composed of wishful thinking rather than hard critical analysis. Furthermore, the written plan provides the opportunity for traders to conduct a post-mortem analysis on the trade (we will discuss this in detail later). It is probably easier for traders to acquire the discipline to fill out the trading plan than it is to acquire the psychological discipline necessary to function without a plan.

You should fill out a trading plan whenever you are thinking of trading. You may see a chart pattern or read an article in the paper and think that there is something worthwhile to follow up on. You may become bullish on a particular underlying instrument because of a particular analysis you have done. You should then fill out the trading plan before entering the position because it will enforce your self-discipline.

A trading plan should address the two major styles of analysis, technical and fundamental. I suggest that you analyze each trade from both perspectives. The elimination of one technique will leave you trading with one eye. The use of both techniques combined provides a synergy and it also allows you to eliminate absurd trades.

Of course, most traders trade only with technicals. The trading plan outlined in this section does not include both technicals and fundamentals for purposes of illustration but you should modify the form to fit your particular trading style. I've simplified the plan and only include a section on Price Scenario where you can make notes on your analysis of the fundamentals and/or technicals of the underlying instrument. Make it yours and you will find your self-discipline enhanced.

The first section of the trading plan should be composed of general information such as the name of the underlying instrument and the date. A second section includes your analysis of the underlying instrument.

The third section is about the actual option(s) that you will trade. Here you will outline your attitude on Implied Volatility and other considerations. These other considerations could include a discussion of the current tradeoff between gamma and theta. Or it could outline a particular scenario you are looking for in the options.

The final section is all about the actual strategy. Here you will identify the contract month(s) and the strategy that is being initiated. You will then identify the initial entry technique. Then jot down the margin and commission.

I have been trading for many years and I am always amazed at how much better my original plan is than what I end up doing. I change my plan in mid-stream far too often. When I go back and see what would have happened if I had simply stuck to my original plan it is nearly always better.

Why? Because it is devised in an atmosphere of calm and cool reason rather than in the heat of battle. This gives a much clearer picture of the future and the best way to play it. It also creates a much better atmosphere for self-discipline. Here's the plan; now stick to it.

One of the key reasons why I recommend this approach to nonprofessional investors is that it helps to save time. You write the plan once and do not deviate no matter what happens in the future. This usually means that you don't have to call your broker to change orders very often and you certainly don't have to re-analyze the market. OK, perhaps you should re-analyze, but perhaps only after several weeks or even months have gone by, so that you don't spend too much time on it.

Some people will say that this is ridiculous and that not taking into consideration changes in market conditions is foolish and will lead to losses. It turns out that this is not necessarily true. It sounds good in theory but doesn't work in fact.

What happens is that you second guess yourself and don't keep as much self-discipline. You read another article that makes you second guess your deeply thought out analysis in the trading plan and tend to pull out of the trade based on just a little bit of new evidence. I wouldn't have a problem if you went and did the whole analysis from scratch if you had read a new article and thought that the conditions had changed enough to exit the position. But few people have the self-discipline to do this. It is hard enough to get people to do the initial trading plan.

The basic problem is that the second guess occurs in the heat of battle without the benefit of a calm reasoned approach. This means that you will shade all of your analysis toward what your heart or guts wants rather than what your brain wants.

I have trained many traders over the years and few trades work out better by overriding the original plan.

Of course, if you have a position on for many weeks, you may want to start your analysis all over. There will be enough new information that needs to be processed. However, you may want to even consider exiting the position temporarily to make sure that you have sufficient self-discipline while you do the new analysis! The main thing that you will likely need to change is the exit rule. That old trendline might not be valid anymore. Still, be careful to not change the original plan too much.

THE POSTMORTEM

This is one of the truly great techniques for attaining greater self-discipline, increasing your skills as a trader, and focusing more on educating yourself. I am a big fan of postmortems and have written about them for over 25 years.

A postmortem is taking each of your trades and tearing it apart from the perspective of seeing what you can learn. This is easiest if you are using a trading plan because the plan is a record of what you were thinking and you will not have to rely on your faulty memory to figure it out.

The first thing to look at is the trading plan and see how your analysis held up. When you said that the implied volatility was bearish, did it go down? Were your milestones the correct milestones to consider? Did you correctly identify the driving fundamentals?

As far as self-discipline is concerned, the key factor is the action section of the trading plan. Did you follow your plan? Did you enter and exit the trade where you said that you would and using the techniques that you said you would? Grade yourself hard because it is here that your lack of self-discipline will really show up. It is here that most traders fail. They typically enter the trade correctly but fail to use the exit technique outlined in their plan. They either panic and jump out too soon or get stubborn and don't get out until far too late.

Take the trading plan and use a red pen to grade yourself. Mark on the plan where you succeeded and where you failed. It's important to see where you succeeded because you want to promote good habits in your trading. You want to see where you failed so that you can reduce the propensity to do it more.

Take the initial trading plan and your postmortem and file them away. Then, every several months, take them out and read through them. You will find it fascinating to see a living record of your trading.

Look very closely for patterns of success and failure. For example, I studied Elliott Wave Analysis for months. I initiated many trades largely based on my Elliott Wave analysis. I gave up on it when I studied my postmortems and realized that I rarely had a winning trade using Elliott Wave. That doesn't mean that Elliott Wave is not a valid form of analysis but it does mean that I couldn't apply the concepts and make money.

You will start to see areas where your analysis is consistently leading you to profitable trades or where your behavior is leading you to losing trades. Study the profitability of your techniques and, more importantly, where you succeeded or failed from a self-discipline point of view.

Notice how the postmortem forces you to grade yourself and your techniques. It forces you to learn more about trading. It forces you to become more focused on education and self-discipline. You will feel less pressure to make money and more pressure to become a better trader. You will either unlock the key to becoming a successful trader or you will find the reason why you cannot be a profitable trader.

THE BOTTOM LINE

We have now completed our exploration of how to be a winning options trader. We covered what is, in my opinion, the most important issue: self-discipline. I showed you proven techniques that can boost your self-discipline. I showed you concepts to help you understand your motivations for trading and how they impact your profitability.

I believe that a combination of the techniques outlined in this book with tight money and risk management can turn any trader from showing losses to at least breaking even, and that is a remarkable turn of events when you consider that roughly 90 percent of traders lose money. You should be able to get into the top decile of all traders with these techniques.

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About the Author

Courtney Smith is the Chairman of the Investment Mentoring Institute, an organization devoted to building great investors. The Investment Mentoring Institute provides training and mentoring for individual and institutional investors in stocks, futures, and foreign exchange.

Courtney Smith is also President and Chief Investment Officer of Courtney Smith & Co, Inc. which manages money for institutions, family offices, and high-net individuals.

He is also the CEO and Chairman of Greater China Technology, Inc. a company which outsources software development to China.

He was the Chief Investment Officer and Chief Strategist of Orbitex Management, Inc. during the late 1990s. Orbitex managed mutual funds and portfolios for institutions and individuals.

He was the editor of Courtney Smith's *Wall Street Winners* newsletter. This popular investment advisory newsletter was ranked number one in performance by the Hulbert Digest.

Mr. Smith is the owner and Editor-in-Chief of *Commodity Trading Consumer Research* (CTCR). CTCR has been providing insights to the futures community since 1983.

Previously, he was President and Chief Executive Officer of Quantum Financial Services, Inc., a futures and stock brokerage firm. Mr. Smith was First Vice President and Treasurer of the New York branch of the Swiss bank, Banca della Svizzera Italiana (BSI). At BSI, Mr. Smith managed mutual funds, client accounts, and was responsible for the trading activities of the New York branch as well as trading and marketing fixed income and foreign exchange derivatives for the entire bank. He was also responsible for the funding and balance sheet of the branch.

Mr. Smith was previously Group Vice President in charge of Financial Derivatives at the French bank Banque Paribas, New York, and was Vice President and a Director of Research and Commercial Services for PaineWebber, Inc. Mr. Smith managed client accounts prior to joining PaineWebber.

Mr. Smith is the author of six books, including *Profits through Seasonal Trading* (John Wiley & Sons, 1980), *Commodity Spreads* (John Wiley & Sons, 1981 and Traders Press, 1989), *How to Make Money in Stock Index Futures* (McGraw-Hill, 1985, paperback edition 1988), *Seasonal Charts for Futures Traders* (John Wiley & Sons, 1987), and *Option Strategies* (John Wiley & Sons, 1987, 2nd Ed., 1996). Mr. Smith is also the author of chapters in several books.

He is on the board of directors of several unaffiliated corporations.

Mr. Smith has been a featured speaker at investment conferences throughout North America and Europe. He has appeared on over 1,000 national television shows including Wall Street Journal Report, and Moneyline as well as other shows on CNBC, Fox News, Bloomberg, CNN, and CNNfn.

For More Information

The world of options trading is very dynamic. We have set up a special web site for readers of this book: www.BestOptionStrategies.com. The site contains:

- Options calculators
- Reviews of options books and products
- Articles that go into more detail about topics in this book
- Interactive forums where you can learn from other option traders
- Options trading ideas

And much, much more!