I just trade options when my brother is using the Nintendo.

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This book was prepared using LaTeX2e with the KOMA-Script and $\mathcal{AMS}$-TeX macros. All illustrations were created using METAPost.
The software and fonts were provided free of charge and more importantly, without any restriction on their use. I wish to acknowledge the generosity as well as the brilliance of the many authors of these packages as well as the American Mathematical Society for making this software available to me.

A warning to any who may venture inside these pages.

Every effort has been made to eliminate errors. However, the reader must accept any and all responsibility for any decisions he may make based on the content of this book. I welcome suggestions for improvement and will correct them in a later version.

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Preface

This book is a response to the many hundreds of requests I have received from newsletter readers for more information on option trading. These readers want more information on particular strategies than it is practical to include in the newsletter. I hope it helps. Here you will find a discussion of every options strategy I have employed since the newsletter's inception. Should the future brings a new strategy to the newsletter, I will add material to the book to explain it in more detail. So this book may grow over time.

Because the book covers only the strategies I've shared with readers, it differs significantly from typical books on options, which try to cover every possible options strategy. I suspect this limitation will prove an advantage to the novice at options, for whom this book is intended. While there is undeniable educational value in studying all types of option strategies, most beginners find an endless stream of them difficult to absorb and ultimately confusing and frustrating.

I would suggest that the most value from this book will be obtained by using it as you follow along (either passively watching, or actively engaging in) the options investments in the newsletter.

I must take the opportunity to express my deep gratitude to Arlo McKinnon, Dorothy Weglend and Xaio-mei Lee. As experienced investors and yet with little to no experience at options, their input was invaluable. They read several versions of the book, sent detailed notes and questions, as well as suggestions. If you find any value in this book, these are the people responsible for it.

Nathan Sturman, options trader extraordinaire, read several versions of the book and helped correct the worst of my errors. All blemishes and mistakes remain my own. All the responsibility for any use of the information I provide remains yours. I make no warranty or guarantees that you will make money using the information provided here. That is completely up to you.

I must also acknowledge the debt I owe to Eryk Gorski, dear, brilliant and generous friend, who spent many hours convincing me to make my first options trade.

I welcome corrections and suggestions for improvement. If you have a suggestion, please send me an email. I regret that an immediate response is not likely to be forthcoming. If I do use your suggestion, you will be credited as a contributor in future versions.

General Approach

My own approach to options investing comes from my background as a value investor. I base my decisions on the underlying business, its health and its economic advantages. I then layer options trades on top of this. In some cases, this is done in connection with

stock ownership, and in some cases it is a pure option play. But it is always based on the fundamentals of the company.

What to do after you have read this book.

If you are a complete novice at options, you should focus on the simplest strategies. Covered calls would be a good way to get your feet wet at options. Once you have a few of these under your belt, you might wish to try a simple bull call spread, or a diagonal bull call spread with a long LEAP instead of stock. If you are fortunate to have a more experienced friend or advisor who can help you with the decisions you need to make along the way, then you can make more advanced trades.

When dealing with options, it is important to use only strategies that you understand completely. This means not only having a clear idea of how much money you may make, but also of how much money you may lose, and how to minimize your losses when possible. Even the most experienced investor will have trades that go wrong. You need to have the knowledge and emotional strength to extricate yourself from a difficult situation if you end up in one. In some cases, this may mean accepting a 100% loss of capital.

Options are leveraging instruments, and you do not need to invest much money to make excellent returns. It is much better to have several small positions than one gigantic one. This will keep your potential losses small, and avoid the potentially dangerous mistake of excess leverage. For option only trades, such as spreads or synthetic longs, I recommend using only 1-2% of your investable cash for each position.

I wish you an enjoyable and profitable investing experience.

1 The Basics

Options have a bad reputation. Most people imagine them being used by greasy little day traders with Italian names who drink too much coffee and smoke too many cigarettes. I held this mistaken view for many years myself, until a good friend[1] and sharp investor finally talked me out of my uninformed prejudice.

As I learned about options, I found that they can help my investments when they are flat-lining, make money even in down markets, and become outstanding performers when markets are up. Just as with stocks, investing with options can be speculative and high-risk, or intelligent and informed.

Another misconception about options is that you need a degree in higher mathematics to use them. While some mathematics is certainly helpful, it isn't necessary.

I approach options as an *investor*. Viewed this way, buying or selling options is not very different from buying or selling stock. In both cases, you need to understand the company, which means having a good grasp of its financials, competitive advantage and any risks it may face.

This chapter describes the basic concepts of options. Other chapters will discuss specific strategies and will assume that you know the material covered here.

1.1 Overview

The basic idea behind options is hardly new — contracts to buy or sell something for a set price in the future have been around for thousands of years. Stock options made their formal debut in 1973, on the Chicago Board of Options Exchange.

What you are buying when you purchase an option contract is the right to buy or sell 100 shares[2] of a particular stock at a specific price (the **strike price**) anytime before a certain date (the **expiration date**). If you exercise your right to buy or sell, it is called **exercising the option**.

It's important to remember that these are rights, not obligations. The purchaser of the option contract has all the rights, and the seller has all the obligations. That means if you decide to exercise your right to buy or sell stock as the purchaser of an option, your counterparty (the seller) *must* sell you their stock, or buy your stock. And they must do it at the agreed upon strike price. While this may sound like it's better to be a buyer than a seller of options, the opposite is often the case.

[1] Thanks Eryk

[2] Some option contracts specify different amounts of stock, but this is not common.

There are only two kinds of options — calls and puts. Call options give you the right to buy stock at the strike price specified by the option. So if you happen to own a call option on IBM with a strike price of $25, and IBM shares are selling for $40, you can exercise your option and buy IBM for $25. You can then turn around and sell the shares for $40, making a profit of $15 per share.

The amount you pay for an option is called the option's **premium**. Buyers and sellers of options price the premiums pretty rationally. For example, if IBM shares are selling for $40 a share, an IBM call option with a strike price of $5 will be more expensive than one with a strike price of $15. Why? Because the strike price of $5 allows you to purchase IBM shares at a greater discount to the market.

Put options give you the right to sell stock at the strike price of the option. If you own a put option on Xerox with a strike price of $25, and Xerox shares are selling for $15, you can buy shares for $15 and then turn around and exercise your put, forcing your counterpary to buy shares at $25 — $10 above the current market price. So it's logical that put options become more expensive the *lower* the share price drops below the options strike price.

There is an active trading market for options contracts, which means that you do not need to exercise the option to make a profit from it. Just as someone sold you the option when you bought it, you can sell it to someone else after it has become more valuable. In fact, most options are not exercised.

Example

You have been following WHOOPIE!, makers of the famous Whoopie Burger, for several years. Recently WHOOPIE! had some trouble which sent their shares down from a high of $20 to their current price of $10. You think the market is over reacting, and decide to buy a call option, since you believe the shares will rebound.

So you buy a call option for a premium of $2.00, which has a strike price of $10. Your call expires in three months. Option quotes are give in **points**, or the price per share. Since option contracts usually specify blocks of 100 shares (called "round lots"), you will pay $200 plus commissions for the call option.

One month later, WHOOPIE! is trading for $17. As a result, your call is worth a lot more money. In fact, it will be worth around 9-points ($9.00 per share, or $900 for the contract). You sell your call option for this price, making a profit of $700.

Since someone who purchased 100 shares of Whoopie! at $10 a share would make the same profit as the call buyer in this example, you might wonder why you should bother with options. The answer is *leverage*. The purchaser of shares would invest considerably more for the same return. Putting it in terms of percentages makes it clearer:

Share Holder		Call Option Buyer	
Buys 100 shares of Whoopie!	$1,000	Buys 1 call option on Whoopie!	$200
Sells the shares of Whoopie!	$1,700	Sells the call option on Whoopie!	$900
Profit	$700	Profit	$700
Return	70%	Return	450%

The advantages of leverage are obvious. Of course, there's a downside. There's always a downside. If Whoopie!'s share price didn't increase until after your option contracts expired (three months, in this example), they would expire worthless. In this case, you would lose 100% of your investment. The shareholder may be better off in this case, since they will still own the stock and can wait as long as they need too for the price to recover, or recoup some of their investment by selling at a loss.

You've probably noticed that in our examples, the options reflect the price of the stock. In fact, *options have no value of their own.* An option's price is determined primarily by the activity of the underlying stock's price. This is why options are called **derivatives** — their value is derived from the price of another security.

Other factors play a role, and we'll get to the details of all this shortly. But first, here's a similar example for a put option:

Example

Just before WHOOPIE! took its famous price plunge from $20 to $10, you bought a $20 put option for 1-point.[3] As described previously, the stock plunged from $20 to $10. As a result, your put gained in value by about 10-points. It is now selling for $11.00. You can sell this option for a net-profit of 10-points per share, or $100 per contract.

Or, if you own shares and want to get rid of them, you can execute the option and force someone to buy them from you at $20 per share. In this case, the put is a form of *insurance policy* which pays off if your shares decline.

As mentioned previously, being a seller of options can also be a smart move. Here's an example from the point of view of a call seller:

Example

You own 100 shares of Arlo Ltd., a political cartoon company. Your shares have doubled from your $20 purchase price and are now worth $40 a share. You think the shares might drop, but you don't want to sell yet. So you sell a call with a strike price of $40, which expires in two months, for 5-points. ($500 total). The $500 is immediately deposited in your brokerage account.

Moving forward two months to the option's expiration date, here's how the situation would look if the share price dropped:

[3]The strike price is $20, the price of the option is $1.00 per share, or $100 for the entire contract.

Stock Price	Stock only	Stock + Put
$40	$2,000	$2,500
$39	$1,900	$2,400
$38	$1,800	$2,300
$37	$1,700	$2,200
$36	$1,600	$2,100
$35	$1,500	$2,000

Note that if the share price drops to $35, with the call you still have the same net gains as just owning the shares when the price is $40. For prices between $40 and $35, you actually make more profit.

1.1.1 Up To The Moment Summary

Let's take a moment and summarize what we've covered so far:

- Options are way cool.
- As cool as they are, it's better to use options from the point of view of an investor, not a speculator.
- Options give rights to sellers, and obligations to buyers.
- Usually, option contracts work in round lots of 100 shares.
- Option premiums are quoted in points, which is the price per share. You must multiply by the number of shares in a contract (usually 100) to get the total price of the option, then add commissions.
- All Options are contracts with five elements:
  1. Its type (call or a put).
  2. Its underlying stock - unique to each option contract.
  3. Its expiration date.
  4. Its strike price
  5. Its premium, which is the price you pay for the option (or are paid for selling the option).
- Call Option Properties:
  1. Gives the call buyer the right to buy the underlying stock at the strike price of the option.

2. Obligates the call seller to sell the underlying stock at the strike price of the option.
3. Increase in price when the stock price goes up.

- Put Option Properties:
  1. Gives the put buyer the right to sell the underlying stock at the strike price of the option.
  2. Obligates the put seller to buy the underlying stock at the strike price of the option.
  3. Increase in price when the stock price goes down.
- Options have no value of their own, but derive their value from the price action of the underlying stock.
- You can buy calls for leverage.
- You can buy puts for insurance.
- You can sell calls for income.

That's quite a bit! Go have a pizza and a coke, and take in a movie. When you are rested and ready to go, continue with the next section. When you come back, we'll focus on call options exclusively from here through the next few chapters. We will take up the subject of put options again in chapter 6.

1.2 The Major Factors That Affect An Options Price

There are four major factors (or six, depending on how you count them) that affect the price of an option. Listed roughly in order of importance, they are:

1. The relationship of the strike price to the share price of the underlying stock.
2. The time left until the option expires, and the volatility of the stock.
3. The dividend yield of the underlying stock.
4. The current risk-free rate.

The first two are by far the most significant for all options. The last two are of less importance. If the underlying stock has a high dividend yield, it can affect the price of an option. The most controversial is the effect of the risk-free rate (usually considered to be the rate of 90-day Treasury bills). Higher rates imply slightly higher option premiums and vice-versa. The extent to which this is a factor for short-term options is not agreed on, so we won't discuss it further here. Longer lived options (called LEAPS) show the effect of the risk-free rate more strongly, and we will return to this in subsection 13.1.3.

1.2.1 Relationship of Share Price and Stock Price

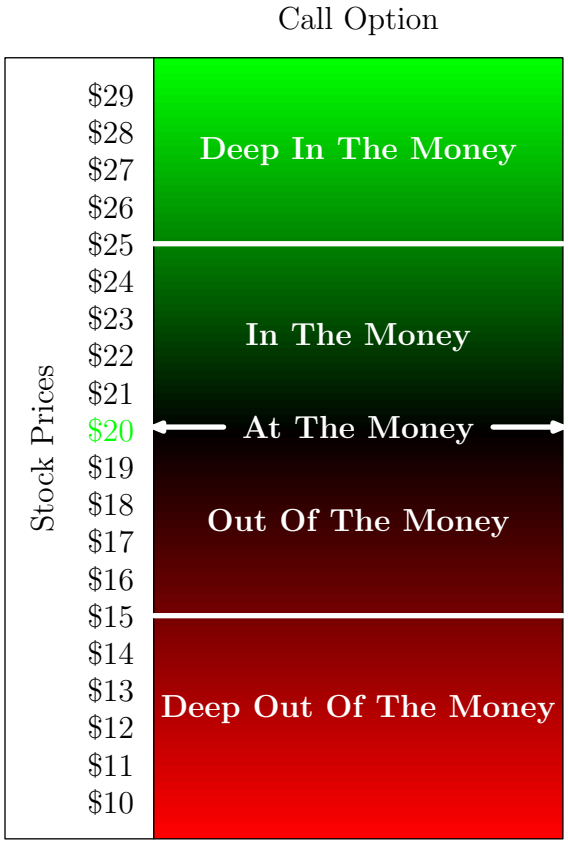

Figure 1.1: In-the-money, at-the-money and out-of-the-money call option with a $20 strike price.

Because the relationship of share price to stock price is of primary importance, it's convenient to have terms to describe the ways these prices relate. As illustrated in Figure 1.1, when price of a call option is equal to the stocks price, the call is **at-the-money**. If the strike price is below the stock price, the call is **in-the-money**. If the strike is way below the stock price, the call is said to be **deep-in-the-money**. Some people say if the stock is $5.00 or more above the strike, then the call is deep-in-the-money. Other people say that they know a deep-in-the-money option when they see one. It's not worth fighting over. Finally, if the strike is above the stock price, the call is **out-of-the-money**.

All options tend to be more valuable when they are in-the-money, and less valuable when they are out-of-the-money (indicated in the diagram by various shades of green and red). The deeper-in-the-money an option is, the more valuable it becomes. The opposite is also the case — farther out-of-the-money an option is, the less valuable it becomes.

This is all very logical. After all, if you own an in-the-money call, you can buy shares of the underlying stock at below market prices by exercising your call. You would expect

these calls to trade for a higher premium, and they do.

1.2.2 The Intrinsic Value of Options

If an option is deeply-in-the-money, or deeply-out-of-the-money, the other factors tend to have very little effect on the price of an option. And at the moment of expiration, this relationship is all that matters. Out-of-the-money options will expire completely worthless. In-the-money options will be worth the difference between the stock price and the option's strike price. Table 1.1 gives an illustration for a hypothetical call with a $20 strike price.

Stock Price	$20 Call Value at Expiration
$15	0
$18	0
$20	0
$22	$2
$25	$5
$30	$10

Table 1.1: Value of a call with a $20 strike at expiration.

Figure 1.2 shows this situation graphically. The vertical axis is the price of the call, and the horizontal axis is the stock price. Note that the option price remains stuck to zero until the stock price reaches the strike price of the option. At that point, the option premium curve angles sharply upwards, and grows linearly with the price of the stock.

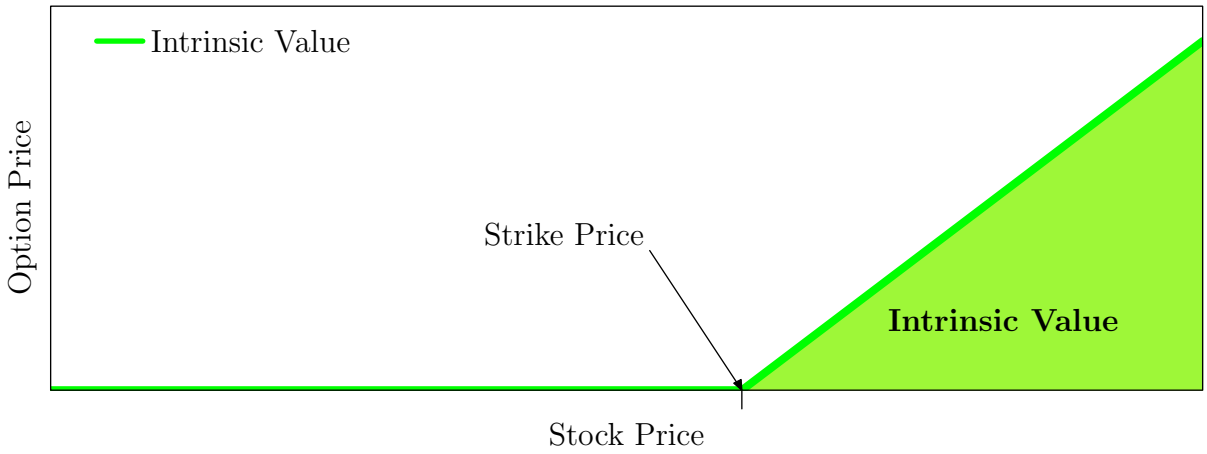

Figure 1.2: Price curve of call option at expiration

Since any option is always equal to at least the difference between its strike price and the current share price, Figure 1.2 also gives the minimum price curve — the lowest price a call can be worth at any given stock price.

The difference between the strike price of an in-the-money option and the share price of the stock is known as the options **intrinsic value**, and can be calculated easily:

Intrinsic Value = Stock Price - Strike Price

1.2.3 Time to Expiry: The Time Value Premium

This is a subject of great importance to option investors, so we will examine it closely.

The farther away an option is from expiration, the higher its price will be. This is true for both in-the-money and out-of-the-money options. This reflects a call buyers natural desire to have as much time as possible for the stock to move in his favor, which will increase the price of his call options.

This means that prior to the option's expiration, the market value of an in-the-money option's premium will be a combination of its intrinsic value (subsection 1.2.2) and an additional amount which is usually called its **time value premium** or simply the option's **time value**. Since the time value portion of the premium is whatever is over and above the intrinsic value, you can easily find the amount of an options premium which is due to time. First find the intrinsic value as described in the previous section, then:

Time Value = Option Premium - Intrinsic Value

A simple algebraic substitution gives you a quick way to calculate the time value directly:

Time Value = Option Premium + Strike Price - Stock Price

Perhaps it's time for an example:

EXAMPLE

ARLO shares are trading at \$30, and a March \$25 call is selling for \$7.20. The premium — the entire amount you must pay per share for the call, is \$7.20. The intrinsic value of the March \$25 call is:

$$\$30 - \$25 = \$5.00$$

Since the option is selling for \$7.20, the time value is:

$$\$7.20 - \$5.00 = \$2.20$$

Or using the last equation to calculate it directly:

$$\$7.20 + \$25 - \$30 = \$2.20$$

Options which are out-of-the-money have no intrinsic value — their entire premium is time value.

1.2.4 Revisiting the Call Option Price Curve

Obviously when time value enters the picture, the simple curve shown in Figure 1.2 does not apply. Adding the time value premium gives us the more realistic curve shown in Figure 1.3. This graph shows that the actual call option price curve is a gently curving concave line, tending upwards. This curve is idealized — an actual call option price curve would be more jagged.

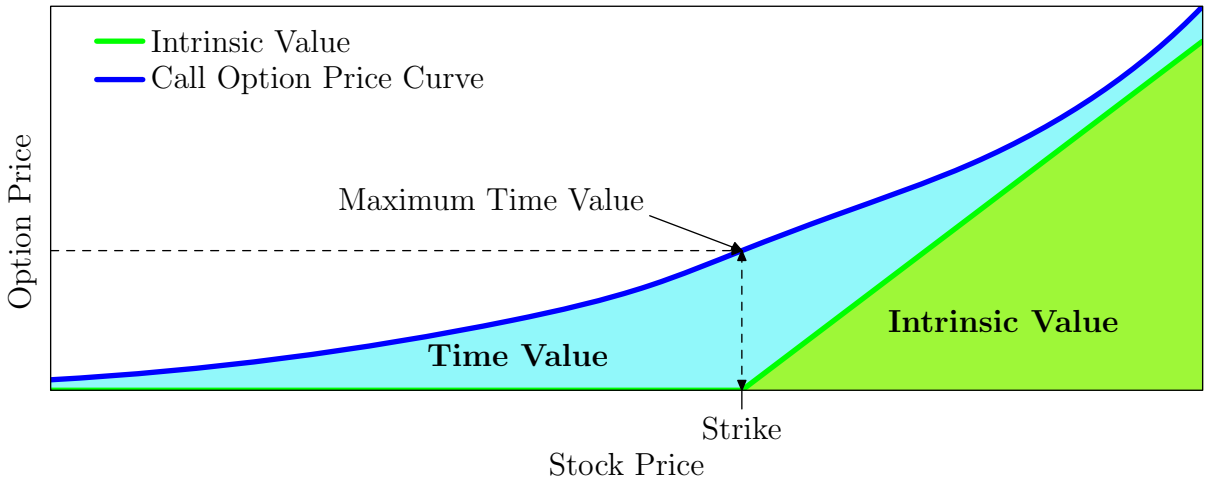

Figure 1.3: Price curve of call option with time value included.

There are several points of interest in this graph. Notice that an option's time value increases as the stock price approaches the strike price. The time value is at its maximum at the strike price. Time value will be at its minimum when the option is deeply-out-of-the-money, or deeply-in-the-money. This is clear in the graph, where the call option price curve comes very close to the intrinsic value line at both extremes of the graph. From this you might guess that there are other factors, besides time, which affect an option's time value premium, and you would be guessing correctly.

Time remains an important factor. Figure 1.4 shows the graphs of three call options. All of them have the same strike price but different expiration dates. In addition, a time-axis has been added — the time displayed in this graph is 3-months. Note that at every point in the three month period, the 3-month call sells for less than the 6-month call, which in turn sells for less than the 9-month call. The difference in prices of the three calls is greatest at the strike price — at the extreme ends of the graph, the curves are much closer together, indicating there is much less price difference between the calls at those points. Note also that at the three month point, the 3-month call expires with a value equal to the intrinsic value of the option.

Books on options (including this one), tend to focus on the prices of options at expiration. There are good reasons for this. Many options strategies will be most profitable when the options expire worthless. But another reason is that it is only at expiration when the

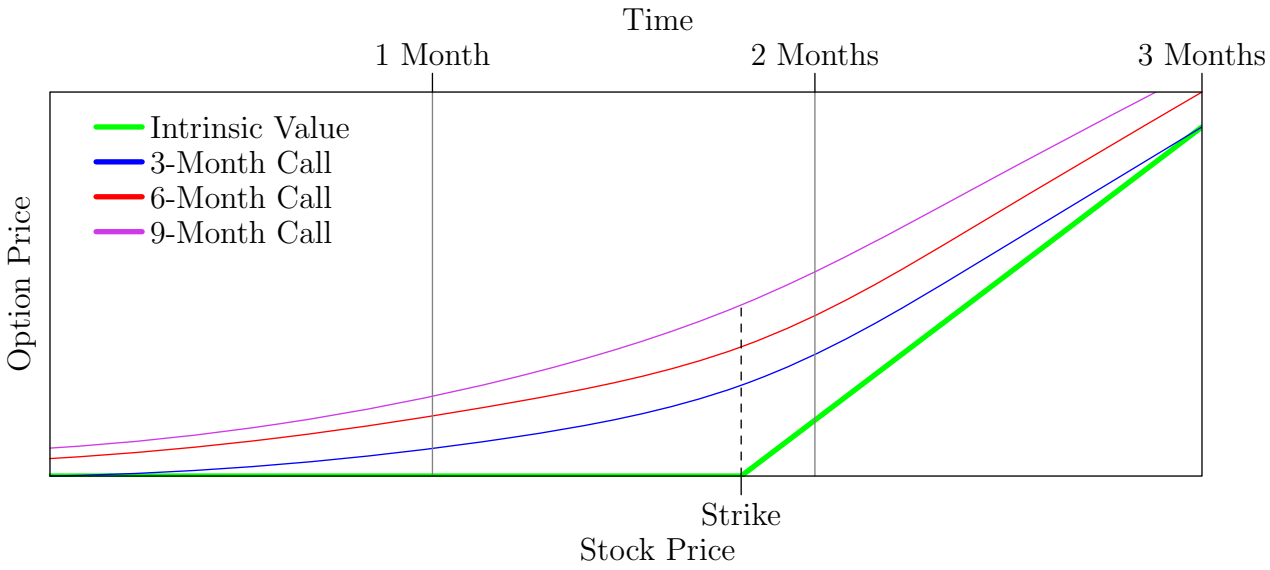

Figure 1.4: Comparison of three call options with the same strike price but different expiration dates over a three month time period.

options price can be predicted with 100% accuracy. Prior to expiration, the many forces that affect an option's premium make it very difficult to predict. There are mathematical equations, called **option pricing models**, which attempt to do this with varying degrees of success. The most famous is the Black-Scholes model, which is introduced in chapter 14.

1.2.5 The Rate of Time Value Decay

Another point to note in Figure 1.4 is that the curves are not parallel, as you might expect. This is due to the important fact that the *rate of decay of an option's time value is not linear*. It is not even constant throughout the life of an option — *time value premiums decay much more rapidly as the option nears expiration.* I won't get into the mathematics of time value decay at this point, but I will present a graph. Figure 1.5 illustrates how the time premium of an option decays over a 9 month period. Note that the curve is not a straight line. If you examine it closely, you will see that at the beginning the curve is nearly horizontal. As the time to expiry grows closer, the curve grows gradually steeper. Somewhere near the final month of the option's life, the curve becomes dramatically steeper, becoming nearly vertical. This is true for all options: the rate of time decay is slower the further away an option is from expiration, increasing significantly as the option nears expiration.

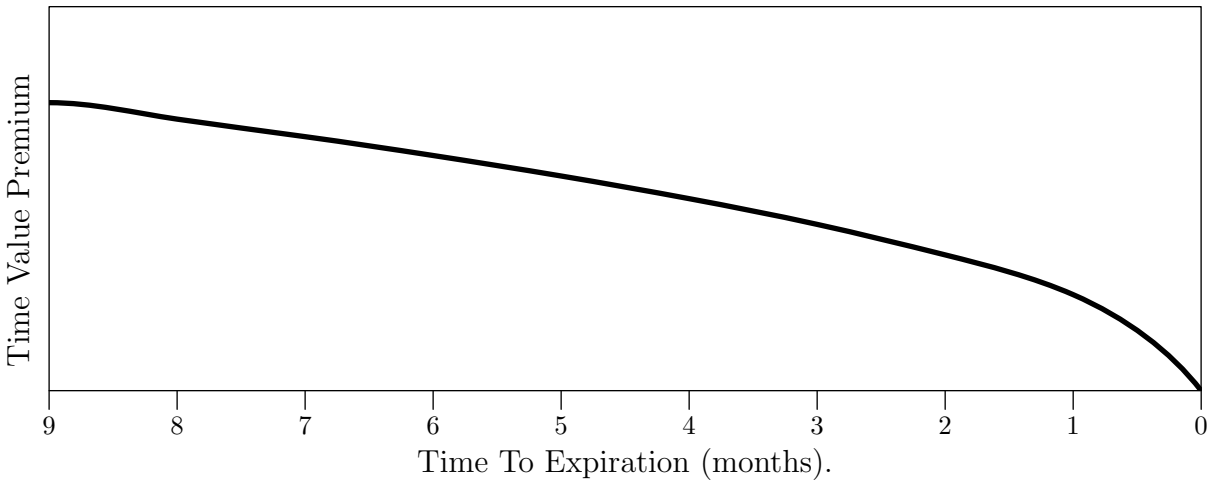

Figure 1.5: Time value decay of a 9-month call option.

1.2.6 The Influence of Volatility of the Underlying Stock

In truth, "time value" is a bit of a misnomer. For highly volatile stocks, volatility will have a much more significant effect on the price of the option than the time to expiration. *More volatile stocks have higher option prices.* This makes sense, because if a stock has shown the tendency to make large moves upward, call buyers will be willing to pay higher prices for the calls. If two stocks are selling for exactly the same price, but one is highly volatile while the other isn't, the more volatile stock will have higher priced options. This will be true until the last few weeks before expiration, when even the most volatile stock's options will lose time-value premium. Prior to that, which is most of the options life, volatility holds sway.

The four variables discussed: stock price, strike price, time and volatility interact in complex ways. A rising stock price may push the price of a call up, while decreasing time will tend to push it down. This means you can lose money on a call even if the stock price rises, if you pay too much for the time value. The time value may decay so much that the rising stock price can't make up the difference. Because of this, a fundamental principle of option investing that will be repeated again in future chapters is that you should always strive to *sell time value, but purchase intrinsic value.*

1.2.7 The Dividend Rate

The dividend yield of the underlying stock can be important, especially if you are an option seller. Dividends tend to depress call option premiums: In fact, *the larger the dividend of the stock, the lower the price of the call options.*

There are reasons for this. Stock prices tend to go down by the amount of the dividend after it is paid out, but since call owners do not receive dividends, it's reasonable that

buyers would want to pay less for it.

If the dividend is extremely large, an option might trade for its intrinsic value way before the expiration date of the option. In some cases, it may even trade *below* it's intrinsic value. When an option's price is equal to it's intrinsic value, it is said to be **at parity**. Options which trade at parity are candidates for early exercise. You can see one of the reasons here — if an option is trading at parity or below, traders can buy the calls at a discount, exercise them, then hold the stock until they get the dividend.

1.2.8 Up to The Minute Summary

Here's a summary of the new material we've covered.

- The relationship of the strike price and the call price is a significant factor in the price of an option.
- Terms describing the relationship of a calls strike price to its share price are:
  1. A call option is at-the-money when its strike price equals its share price.
  2. A call option is in-the-money when its strike price is greater than its share price.
  3. A call option is out-of-the-money when its strike price is less than its share price
- Options are more valuable when they are in-the-money.
- Options are less valuable when they are out-of-the-money.
- The Major factors affecting an options price are:
  1. The relationship of the strike price to the share price of the underlying stock.
  2. The time left until the option expires, and the volatility of the stock.
  3. The dividend yield of the underlying stock.
  4. The current risk-free rate.
- These four factors interact in complex ways.
- An in-the-money options intrinsic value is the difference between its strike price and the stocks share price.
- The time value of an in-the-money option is the difference between its intrinsic value and the option premium.
- An out-of-the-money option has no intrinsic value, only time value.
- Time value is greatest at the strike price.
- Otherwise, the further away from expiration the option is, the greater the time value.

- Time value decays most rapidly in the last month or so of an options life.
- Time value is a misnomer: the volatility of the underlying stock can be a much more significant factor than time.
- An options price can be definitely predicted only for expiration.
- Option pricing models can be used to attempt to predict the options price prior to expiration.
- An option investor should strive to sell time value, and purchase intrinsic value.

1.3 Additional Information

We've covered all the basics in the previous sections. We close with a few additional details to round-out your knowledge.

1.3.1 The Mechanics of Option Markets

Details differ from exchange to exchange, and electronic exchanges are becoming more common. The traditional "floor" system still exists at some of the largest exchanges (such as CBOE), and is enhanced by the use of computers.

In a floor based system, there are four participants:

- Market Makers
- Floor Brokers
- Order Book Officials
- Exchange Officials

Market makers are entrepreneurs who own or lease a seat on the options exchange and trade for their own accounts to make a profit. As part of their agreement with the exchange, they have an obligation to "make a market" by standing ready to buy or sell options. Typically, they "make a market" on the options of a few stocks. This allows the market makers to become very knowledgeable about the other traders who deal in options on those stocks.

They employ different strategies to make profits. Market makers typically change strategies, depending on the circumstances of the day or moment. Sometimes they act as "scalpers", who benefit from the bid/ask spread. They will try to buy just as the price is about to rise, and sell just before it falls. Positions such as this are typically held for only minutes at a time.

They can also maintain positions over a longer period.

Floor brokers are typically employees of brokerage firms, such as Schwab, Scottrade, Merrill Lynch, etc. They work for a salary or receive commissions. Their job is to obtain the best price first, and secondly the fastest order execution. An off floor trader will route their order to a floor broker for execution. Most floor brokers have clerical staffs to assist them. Many brokerage firms engage in "prop trading" — proprietary trading for their own accounts. These brokerage may have additional people on the floor of the exchange to seek trading opportunities. They also route their orders through the floor broker.

The **Order book official** is employed by the exchange. They are allowed to trade, but not for their own account. The purpose of their trading is to facilitate order flow. The order book official discloses the best limit orders awaiting execution. (This is similar to the role played by specialists on stock exchanges). They also employ a staff to help keep track of the order book.

Exchange officials are also employed by the exchange. There are two types, **price reporting officials** and **surveillance officials**. The price reporting officials enter the order into the exchanges price reporting system. The details are immediately sent out, all over the world, so that all traders can see the information reflected in the trade. This takes only seconds. Surveillance officials guarantee an honest marketplace, making sure all participants follow the rules and behave honestly.

Example

A NYU professor decides to buy a call option on ARLO. He dials his broker, who takes his order, makes sure it is correct, and then transmits it (usually via computer) to the brokerage firm's representative at an options exchange.

At the exchange, the brokerage firm's clerical staff on the floor of the exchange receives the order, and gives it to a runner. The runner runs to the trading area and finds the firm's floor broker who trades in ARLO options. The floor broker then executes the order by trading with another floor broker, market maker, or order book official. When the trade is complete, the floor broker records the price obtained, and the information about the trader on the opposite side of the trade. The runner, who is waiting for all this to transpire, takes the confirmation back to the clerical staff on the exchange floor. The brokerage firm clerks confirm the order to the main broker, who then tells the customer.

The NYU professor might have decided to login to his brokerages trading site via computer. The steps work similarly, but the electronic systems attempt to automatically route the order to the trading venue that will provide the best execution for the trade.

Mechanics of Assignment

Perhaps ARLO shares do well enough that the NYU professor wishes to exercise his option and own the shares. But if the shares have gone high enough, perhaps the seller of the call will not wish to fulfill his part of the bargain.

This is where the Options Clearing Corporation (OCC) enters the picture. When the Professor tells his broker that he wishes to exercise his call, the broker informs the OCC

that they want to exercise one contract on ARLO. The OCC keeps records on every listed option, which they now check to see which brokerage firms are short ARLO calls. The OCC randomly selects one brokerage out of all the brokerages that are short ARLO calls, and notifies them it has been assigned. They must now deliver 100 shares of ARLO, at the strike price of the option, to the professors brokerage. The brokerage then delivers the shares to the professor, and debits his account for the cost of the shares, plus commissions.

If more than one customer of the broker has exercised ARLO calls, the brokerage can deliver the shares randomly, on a first-in/first-out basis, or by some other fair basis that is approved by the exchanges involved.

The OCC *guarantees both sides of the transaction*. In effect, the OCC becomes the seller to every buyer and the buyer to every seller. Should an option trader fail to perform as promised, the OCC absorbs the loss and proceeds against the defaulting trader.

In this way, options traders do not need to concern themselves with the credibility of their counterparties, only with the credibility of the OCC. Fortunately, the OCC's credibility is high. It is well capitalized and anxious to keep a smoothly functioning market. It can (and often does) enter the process before assignment. If someone wishes to purchase or sell an option and there is not an existing counterparty, the OCC can buy or sell the option to help keep the option markets liquid. As a result, the OCC has a zero net position in the market. Because it has the same number of short and long positions, it has little market price risk.

Besides its zero net position, it requires margin payments from clearing members. Clearing members are securities firms that have an account with the clearinghouse. All option trades must be channeled through a clearing member to the clearing house. Market makers are not clearing members, and their trades must be routed through a clearing members.

These margin payments help ensure the clearing houses financial integrity. The clearing members, in turn, demand margin payments from their trading customers. These are immediate cash payments that show the financial integrity of the traders and limit the risk of the clearing member, and therefore also limit the risk of the clearing house.

Minimum margin requirements are set by the SEC, but clearing members are free to make additional requirements on trading customers, and most do.

1.3.2 Bid/ask spreads and Limit Orders

One of the useful pieces of information available on electronic option trading systems is the bid/ask spread. Sometimes the last price is also made available. The **bid** is the highest price being offered by the buyer of an option. The **ask** is the lowest price being offered by a seller.

In some cases, the spread between these two prices can be very wide, and it may seem that neither reflects a fair price for the option. This can occur if the option has not had active trading for a few days. You should not feel obligated to offer a bid for an option or ask a price for an option that you feel is unfair.

If the option is actively trading, it often works well to "split the spread". That is, to

bid or ask a price that is in the middle of the spread. To do this, you would use a **limit** order. In general, *one should always use limit orders when trading either options or stocks.* While the people involved in the transaction may be honest, why tempt them? A limit order guarantees you a maximum buy price, or a minimum sell price.

1.3.3 Automatic Exercise

At expiration, when an option is in-the-money, it will be automatically exercised on your behalf. If you don't want this to happen, you need to get rid of the option, or call your broker (usually the day before is a good idea), to tell them you do not want the options exercised.

1.3.4 The Number of Shares in an Options Contract

As mentioned earlier, option contracts usually work on round-lots of 100 shares per contract. However, there are some exceptions. The most common cause of a change in the number of shares per contract is due to a stock split. Here are some examples of how stock splits can affect options that you own.

Gorksi Gold shares are selling at $40 a share. You own options on Gorski Gold with a strike price of $30. Gorksi Gold does a 2-for-1 split. This means that the number of shares available for purchase are now doubled, and the stock price per share is cut in half. So if you own 200 Gorski Gold shares pre-split, after the split you will own 400 shares, but the price per-share will be $20, instead of $40.

In a case like this, the strike price of your options will be cut in half, and you will usually be given twice as many contracts. However, if the stock-split does not result in a round-lot, the contract size will be changed. For example, if Gorski Gold was trading at $60/share and did a 3-2 split, the adjustment made to your option contracts would be to multiply the strike price by 2/3'rds, and have each option contract specify 150 shares of stock, instead of the usual 100.

More bizarre contract changes can occur during spin-offs and mergers, where option contracts can be changed to specify fractional shares and even a certain amount of cash. These are quite unusual, but it's good to be aware of them.

1.3.5 Expiration Cycles

Options expire in a predictable cycle — there are three:

JAJO January, April, July and October.

FMAN February, May, August, November.

MJSD March, June, September and December.

Every stock which has options will belong to only one of these three cycles. In addition, shorter term options are always available in the upcoming month for all stocks, no matter what cycle they trade in.

There are also longer term options, called LEAPs, which expire in January of a future year.

Finally, all options expire on the third Saturday of the expiration month, which means that the last day available for trading them is the day before expiration.

1.3.6 Series and Strike Prices

The expiration date and the strike price are used to form subsets of options classes which are called **series**. For example, all options belonging to the Intel class with the same expiration date and strike price form one series of Intel options.

Strike prices are set by the exchange that issued the options. With popular stocks that see a lot of activity, you may find options listed with strike prices that are $1.00 apart. More typically, exchanges use different 'distances' between the strikes depending on the price. Lower priced stocks have options listed $2.50 apart, while higher priced ones are typically $5.00 apart.

1.3.7 Option Symbols

Like stocks, options have ticker symbols which refer to specific option contracts. In practice, it is rarely necessary to refer to them, since brokers usually decode them for you on their bidding screens. Right now, the symbols are currently being transitioned to a new format which is supposedly better than the arcane older format. The new ones seem pretty arcane too, but I guess they are more descriptive. This transition will be completed in May 2010. I will spare you a discussion of the older format, since it will soon be gone for good. The new symbols specify the four properties in the following format:

UNDERLYING+YY+MM+DD+TYPE+STRIKE(dollars)+STRIKE(decimals).

The '+' signs won't be included, I just put those there to make it it a bit more readable.

Here's an example of how it works: A call option on Apple stock which expires on May 22, 2010, with a strike of $20.00 would have the following symbol:

AAPL100522C0002000

Well, that looks about as readable as mud to me. Here's how it is decoded: AAPL (Apple ticker symbol), 10 (2010) 05 (May) 22 (day), C (it's a call, if it were a put, this would be a 'P'), 00020 ($20 dollars), 000 (and zero cents).

Rest assured that I'll continue to follow the practice option traders typically use in writing and conversation, which would refer to this option as a "May'10 $20 Call on AAPL".

1.4 Chapter Glossary

At-the-money Strike price of option is equal to current stock price of underlying.

Call Option A contract between buyer and seller where the buyer acquires the right, but not the obligation, to purchase a specified underlying contract at a fixed price on or before a specific date. The seller of the call option assumes the obligation of delivering the underlying should the buyer wish to exercise his right.

Derivative A security whose price is determined by its relationship to the price of another security. Stock options (calls and puts) are examples of derivatives.

Exercise The process by which the holder of an option notifies the seller of his intention to take delivery of the underlying (if a call), or make delivery of the underlying (if a put), at the strike price of the option contract.

Intrinsic Value The amount by which an option is in-the-money.

Premium The price of an option. Premiums are expressed in points, and must be multiplied by the number of shares in a contract (usually 100) to get the total cost of the option.

Put Option Grants the buyer the right to sell shares at the strike price of the option. Goes up in value as the stock price goes down.

Strike Price The price that will be paid for selling or buying 100 share of stock, set at the time of purchase of an option contract.

Time Value the portion of an options premium above the intrinsic value. If the option is out-of-the-money, the entire premium is time value.

Time Value Premium A synonym for time value.

2 Covered Calls

This chapter assumes you are familiar with the basic concepts of options, as discussed in chapter 1.

2.1 Two Ways to Sell An Option

The first and more familiar way is to first buy the option, then sell it. In "broker-speak" you first **buy to open**, then **sell to close**.

The second way is to first sell the option, then buy it back later. There's "broker-speak" for this too: **sell to open** and **buy to close**. Most people call this **shorting** or **writing** options. Both of these terms mean the same thing, and are used interchangeably.

It is the second method we will be talking about today. And while it may seem like you might end up in jail for selling something you don't own, you won't. Done properly, short option positions, unlike short stock positions, are relatively low risk. Selling call options on stock you own is an excellent way to get your feet wet with options and make some money in the process.

2.1.1 Naked vs. Covered Call Option Writing

As the seller of the call, it's important to remember that your counterparty (the call buyer) has the right to exercise the option. Should they do this, you must then deliver 100 shares of the underlying stock to them. You will be paid the strike price for each share, not the current market price. **Naked call selling** is selling a call without also owning enough of the underlying shares to deliver if the call is exercised. This is a very bad idea. It has the same risk profile as shorting stock, but without any of the corresponding potential profits. As an example of what might go wrong, consider selling a call with a strike of $20 and a premium of $5 without owning any shares of the stock. You might wake up one morning to find the shares, which were below $20, are now selling for $100. In this situation, the call buyer will certainly exercise, and to satisfy your obligation, you must purchase shares on the market for $100, and sell them to your counterparty for $20. The comparatively small amount of premium you receive from selling naked calls does not begin to compensate you for the additional risk you take on. To further discourage you from trying this, Figure 2.1 displays the profit/loss graph for naked calls. Note that the maximum you can make (shown by the microscopic green sliver in the graph) is capped by the premium you received from the call, while the potential loss (the ocean of red) is unlimited.

Covered call selling is much safer. To do this, you sell calls while also owning enough shares of the underlying stock to "cover" your calls if they are exercised. Properly done,

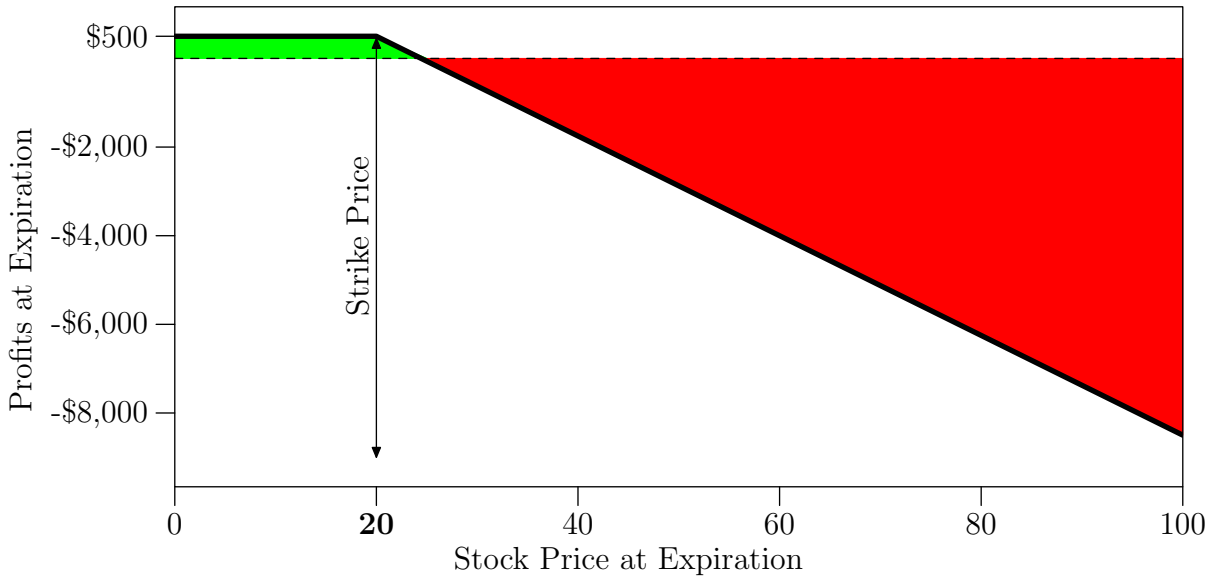

Figure 2.1: Profit graph of a $20 naked call option at expiration, showing potential profits (green) and losses (red).

selling covered calls is a low risk strategy that decreases the risk of owning the stock and can also generate considerable income. *Owning the stock and selling calls on it will outperform just owning the stock if the stock falls, stays the same, or rises slightly.* Covered call selling will not do as well as stock ownership if the stock price moves substantially upwards. This is particularly important since history shows that stock prices, when they increase, do so in sudden spurts. If you have written calls against stock that suddenly heads for the sky, your potential profits may be reduced. Careful selection of the underlying stock and the calls you sell can reduce this risk, but it can never be completely eliminated. For this reason, some investors avoid selling covered calls. This leads us to rule number one:

Rule Number One: Never sell a call against shares that you really want to keep.

There are techniques that can be employed when the stock rises too high or or falls too low, and we will cover them later. But the fact remains that your shares may be called from you before you have a chance to adjust your position.

2.2 Selling Your First Covered Call

It's January, you own 100 shares of Gorski's Goldworks, and you decide to sell a covered call. Gorski's is selling for $28, and you bought it at $20. You find a March $30 call which is selling for 3-points. You log-in to your brokers website, and select "sell to open" the March $30 call on Gorski's Goldworks. The order executes, and your online statement now looks something like this:

DESCRIPTION	QUANTITY	COST	CURRENT PRICE	PROFIT
GORSKI'S GOLD SHARES	100	2,000	28	800
GORSKI'S GOLD CALL	-1	-300	3	0
CASH	300			

Note that your broker records your short call sale with a negative number for the QUANTITY and COST. This makes sense, because you sold something you don't own, and now you have one less of it. Since you were paid for selling it, your cost for this transaction is a 'negative cost' — what you and I would call a payment. You can see that you also have $300 in cash from the sale of the call.

Moving along to February, we see that Gorski's Goldworks shares are now $32, so your short call will be more expensive — it's selling for 5-points now:

DESCRIPTION	QUANTITY	COST	CURRENT PRICE	PROFIT
GORSKI'S GOLD SHARES	100	2,000	32	1,200
GORSKI'S GOLD CALL	-1	-300	5	-200
CASH	300			

Note that as a short positions price goes up, your unrealized profit goes down. If this were a short-sale of stock, you might be a little worried. But since this is an option, you won't lose any money unless you decide to buy it back. The call is in-the-money at the moment, so if it were to be exercised and your shares called away, you will make a profit of $200 in the stock (since you must sell it at the strike price of $30). You still keep the $300 from sale of the call, for a total profit of $500. Exercise prior to expiration is unlikely, but it does occur.

Fast forward to the last trading day before expiration in March. Gorski's Goldworks is now $29. Your call is out-of-the-money again, and most of the time value you sold is gone. The call is now selling for 0.05-points

DESCRIPTION	QUANTITY	COST	CURRENT PRICE	PROFIT
GORSKI'S GOLD SHARES	100	2,000	29.0	900.0
GORSKI'S GOLD CALL	-1	-300	0.05	295.95
CASH	300			

On Monday, when you login to your brokers site, the call will have disappeared but not your profits. Since the call was not exercised, you still have your shares, and can repeat the process for more income.

Note that what you have done here is sold time value, and simply waited for it to evaporate. When it did, you kept the money you were paid for it, and can repeat this process as many times as you like.

2.2.1 Accounting for your Covered Call Profits

Your profits from the covered call reduce your cost basis in your stock. You first need to adjust your call profits for commissions and any taxes you would pay. Let's say your commissions were $10 and you will pay $90 in taxes on your covered call profits of $300. So your net profit is $200, or $2 a share:

Description	Cost	Adjusted Cost
Gorski's Gold	$20	$18

By profiting from the covered call, you have reduced your risk in owning Gorski shares. They can now drop as low as $18 a share before you have a loss of capital. Note that this is not the cost basis you have to report to the IRS when you sell your shares — you will still report the original purchase price for capital gains tax purposes.

2.3 More Examples of Covered Call Writing

Of course, the stock may not cooperate as nicely as it did in the previous example:

Example

If your Gorski shares drop below $25, you will have an overall loss in this combined position of stock plus call options. Whether this is something to be concerned about depends on the reasons for the price decline of the stock, and the amount you spent on the stock.

And it can also happen that Gorski's shares would increase enough in price that your call is in-the-money by expiration:

Example

Instead of falling, shares of Gorski's rise to $40 near expiration. At this point, you have two choices. You can do nothing and let the stock get called. Your counterparty will pay you $30 a share for the stock, and you received 3-points call option premium. Since the stock was selling at $28 when you established the covered call, this gives you 5-points of profit, for a total of $500.

However, you may wish to hold on to your shares of Gorski if you feel it is poised for more growth. To do this, you must buy back the call you sold. This will cost you $1,000, for a net loss of $700 (remember that you were paid $300 for selling the call). But since you still own the stock, you have an unrealized gain of 12-points per share since you established the covered call. Thus your net profit, including realized and unrealized gains and losses, is $500.

In this example, both decisions yield the same profit (this will not always be the case). The significant difference between these two decisions is not that one gives you realized gains and the other does not. Of more importance is that when you buy back the call, you still own the stock. It is not always easy to decide which course is the best. In the end, your own evaluation of the future potential of the shares is what must guide you in a case like this. If you feel the company's stock price is fairly valued, or over valued, then allowing the shares to be called from you is probably the best course. If the companies shares are undervalued and likely to move much higher, then you are better off owning shares.

This example also illustrates how covered calls can limit your potential profits from a steep upward movement in the stock price. The covered call seller will still make money if the stock climbs, but it may not be as much as he would have made without selling the call.

2.4 Profit Graph of the Covered Call

Figure 2.2 shows the profit graph for the Gorski's Goldworks examples in the previous section.[1] Even though the graph shows the numbers for our examples, all covered call profit graphs have the same shape and characteristics shown here.

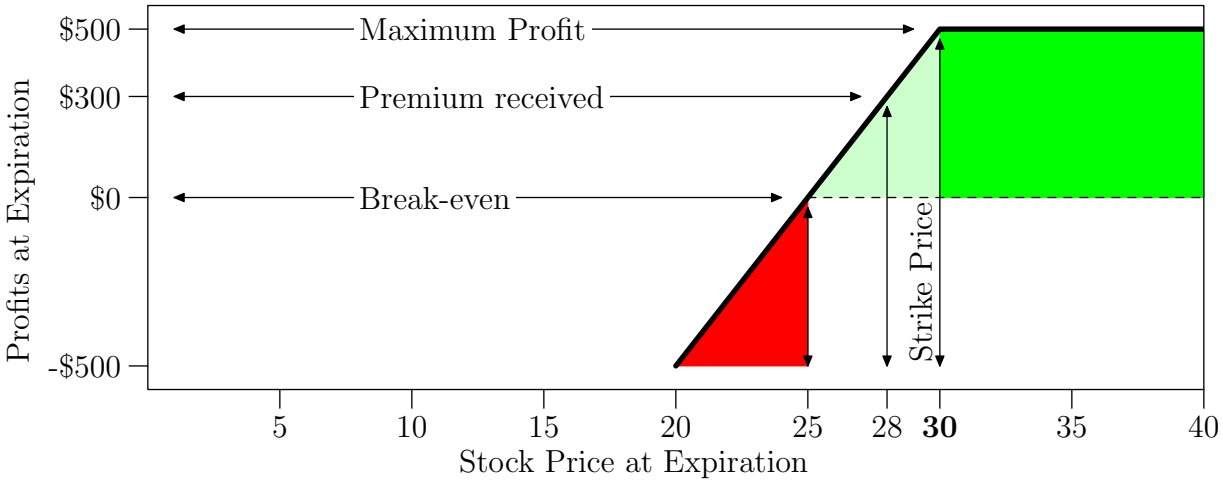

Figure 2.2: Covered Call Profit Graph showing maximum profit region (dark green), risk region (red) and intermediate profits (light green).

There are several points of interest. The **break-even** point is where there are zero gains and zero losses. Here it is at the stock price of $25. All the risks are below the break-even point, and all the profits are above it. The **maximum profit** always occurs when the stock reaches the strike price of the call. In this example the maximum profit is $500. It is obvious from the graph that no matter how high the stock may go above this point, the

[1]The graph makes the assumption that the call is bought back at parity.

maximum profit is not changed. You can also see that if the stock does not change at all, the covered call writer still makes $300.

There are ways to mitigate the problems caused by stock prices rising and falling too much. These will be discussed later.

2.4.1 Calculating the Maximum Profit and Break-even Points

These important points are easy to calculate:

Maximum Profit Per Share = Strike Price - Stock Price + Call Premium

Break-even Point Per Share = Stock Price - Call Premium

The stock price to use is the one at the time you sold your call. More precise formulas, which account for commissions and other costs are given in section 2.6.3, but these illustrate the concept.

2.4.2 Up to the Minute Summary

Here's what we have covered so far:

- You won't go to jail for shorting call options.
- Naked calls are short calls without a corresponding stock position in your portfolio.
- Selling naked calls is asking for trouble.
- Covered calls are short calls sold against stock you own. You must have enough shares to cover each option sold (typically 100 shares of stock should be owned per contract sold).
- Selling covered calls is a low risk way to make money and lower your risk of holding stock.
- You may lose your shares when you sell covered calls against them.
- Rule number one of covered call selling: Never sell calls against shares you want to keep.
- Covered calls will outperform simply owning shares if the stock falls, stays the same, or rises slightly.
- Covered calls can limit your profits from a sudden large increase in stock price.
- Your broker records short call sales with a negative quantity and cost.

- As the option goes up in price, your short call position will show a loss. You won't realize this loss unless you buy back the calls.
- As the option goes down in price, your short call position will show a gain. This is how much you would keep if you bought the call back.
- You should subtract the amount you receive from shorting a call from the cost basis of your stock.
- The maximum profit you will make from a covered call is when the stock is at the strike price.
- The maximum profit is calculated by subtracting the stock price at the time you purchased the call from the strike price of the call, and then adding in the premium received.
- Another point of significance is the break-even point. Below this point you lose money, above it you make money.
- You calculate the break-even point by subtracting the call premium from the stock price at the time you bought the call.

Time for a break, perhaps? Go watch T.V., then come back here when you are rested and refreshed.

2.5 Choosing Stocks as Candidates for Covered Call Writing

Avoid selling calls against stocks that will make large moves either up or down. This means you should be neutral or somewhat bullish on the stock. Many investors purchase undervalued shares which, after a period of time, reach their fair value. Once at their fair value, these stocks tend to trade within a fairly narrow range and make excellent candidates for covered call writing. If you are extremely bullish on a stock, expecting it to make a large rise, writing calls against it is too risky, because you may lose the stock and the gains that go with it, or be forced to buy back your calls at a loss. If you are bearish on a stock you should sell it, short it, or use another options strategy to profit from its decline. You should not write covered calls against it. The chances of its declining well below the break-even point of your position are too great.

2.6 Choosing Calls for Covered Call Writing

Choosing the proper call is equally important — not all calls are created equal. Here are the main considerations:

1. The strike price.

2. The time to expiration.

3. The return and the amount of downside protection offered by the call.

These interact to a degree, but let's take them one at a time.

2.6.1 The Strike Price

You can choose to sell either an out-of-the-money call or an in-the-money call.[2] If you are more interested in keeping your shares, you may be drawn to out-of-the-money calls, particularly if the stock you are considering is highly volatile or you are bullish on it. In-the-money calls usually carry higher premiums than out-of-the-money calls, and therefore provide more downside protection. Out-of-the-money calls have the highest maximum profit potential, but the stock must rise to actually get it.

Example

Dan's Landmine Company shares are selling for $20 a share. An April $15 call is selling for 8-points and an April $25 call is selling for 2-points. The April $15 has a break-even point of $12 — this means the stock must drop more than 40% before you start losing money. The April $25's break-even point is $18 which delivers much less protection. On the other hand, thanks to the out-of-the-money strike price of the April $20, you can make much more money if the stock cooperates. Here's a table of the potential return at expiration for each call using, a variety of stock prices:

In-The-Money Call		Out-Of-The-Money Call	
Stock at Expiration	Net Profit	Stock at Expiration	Net Profit
10	($200)	10	($800)
12	0	15	(300)
15	300	18	0
20	300	20	200
25	300	**25**	700
30	300	30	700

Incidentally, you might find it good practice for your future options trading to check my math in this table. Remember if you do this that since the calls are held to expiration in this example, when the calls are in-the-money, you sell the stock to your counterparty at the strike price of the option.

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[2]Note that selling in-the-money calls may affect your stocks holding period for tax purposes. For details, please see http://www.optionseducation.org/resources/literature/files/taxes_and_investing.pdf

2.6.2 The Time to Expiration

Option buyers want as much time as they can get to let the stock move in their favor before the option expires. As an option seller, your goals are the opposite — you want the stock to trade in as narrow a range as possible and have the call expire worthless, so you can keep the premium. The shorter the time period before expiration, the more pressure is placed on the call buyer and the less on you, the call seller. On the other hand, calls which are only a few days or weeks away from expiration may not have enough time value left to make them worth selling. So you must balance the amount of time left in the call (less is more) against the premium you will receive for selling the call (more is more).

2.6.3 The Return and the Amount of Downside Protection

To decide how much return you want, you must first know how to calculate the return from a covered call position. You want to know both the *return if exercised* and *the return if unchanged*. The first is the amount you would make if the stock were called away. The second is the amount you would make if the stock remained unchanged by expiration. If you sold an in-the-money call, the return if exercised will be the same as the return if unchanged. Fortunately, the computations are not complex.

Calculation of the Return If Exercised and Return If Unchanged.

You calculate your net profit if exercised and unexercised, and then divide that by your net investment. Let's start with net investment — just add all the cash outflows and subtract all the cash inflows to get the total expense:

Stock Cost
+ Stock Purchase Commissions
– Option Premiums Received
+ Option Sale Commissions
Net Investment

Now we find the net profit if exercised Add everything you get, subtract everything you spend to get your net profit:

Stock Sale Proceeds
– Stock Sale Commissions
+ Dividends Earned
– Net Investment
Net Profit if Exercised

Ditto with net profit if unchanged:

$$\begin{array}{rl} & \text{Unchanged Stock Value} \\ + & \text{Dividends Earned} \\ - & \text{Net Investment} \\ \hline & \text{Net Profit if Unchanged} \end{array}$$

Notice that we don't subtract sale commissions when we calculate net profit if unchanged. This is because you usually do not sell the stock if the option expires, but continue to write new calls against it. For in-the-money calls, the profit if unchanged is the same as the profit if exercised.

Now we can compute the returns:

Return if Exercised = Net Profit If Exercised/Net Investment

Return if Unchanged = Net Profit If Unchanged/Net Investment

As with profit if unchanged, if you sold an in-the-money call, the return if unchanged should be the same as the return if exercised.

Calculating the Percentage of Downside Protection

Now we must calculate the percentage of downside protection we receive from the calls. You just divide the break-even point by the points of protection you got from the call. We first adjust our net investment for any dividends we will receive:

$$\begin{array}{rl} & \text{Net Investment} \\ - & \text{Dividends received} \\ \hline & \text{Total Stock Cost at Expiration} \end{array}$$

The break-even point is then:

Break-even Point = Total Stock Cost at Expiration / Number of Shares

We ignore stock sale commissions in this calculation because if the stock has dropped to this point, it will be out-of-the-money. This means it will expire worthless and our shares will not be called. The purchase commissions are already included in the calculation of net investment (see section 2.6.3).

Now we compute the percentage of downside protection. First the number of points of protection received:

$$\begin{array}{rl} & \text{Starting Share Price} \\ - & \text{Break-even point} \\ \hline & \text{Points of Protection} \end{array}$$

And the percentage of downside protection is:

Percentage of Downside Protection = Points of Protection / Starting Share Price

And that's all there is to it — time for an example:

EXAMPLE

You are considering buying 500 shares of Gorski Goldworks at $23 a share. This means you can sell five calls against these shares. You find an out-of-the-money Gorski Goldworks July $25 call selling for $3.

Net Investment:	
Stock Cost (500 shares @ $23)	$11,500.00
Plus Stock Purchase Commissions	8.95
Less Option Premiums (5 Contracts @ 300)	1,500.00
Plus Option Sale Commissions	11.20
Net Investment	$10,020.15
Profit if exercised and return if exercised:	
Stock Sale Proceeds (500 shares @ $25)	$12,500.00
Less Stock Sale Commissions	8.95
Plus Dividends Earned	300.00
Less Net Investment	10,020.15
Profit If Exercised	$2,770.90
Divide by Net Investment	10,020.15
Return If Exercised	27.7%
Profit if unchanged and return if unchanged:	
Unchanged Stock Value (500 shares @ $23)	$11,500.00
Plus Dividends	300.00
Less Net Investment	10,020.15
Profit if unchanged:	$1,779.85
Divide by Net Investment	10,020.15
Return If Unchanged	17.8%
Break-even point:	
Net Investment	$10,020.15
Less Dividends	300.00
Stock cost to expiration	$9,720.15
Divide by shares held	500.00
Break-even point	19.44
Percent of downside protection:	
Starting Stock Price	25.00
Less break-even price	19.44
Points of protection	5.56
Divide by Starting Stock Price	25.00
Percent Downside Protection	22.3%

Returns are sensitive to the size of the position. Larger positions will generally have greater returns and lower break-even points, because commission costs will be a smaller percentage of the initial investment.

One last note: If you are intending to use margin, you must include margin interest and some other stuff in these calculations. I don't do that here since this is a guide for beginners, and beginners shouldn't use margin. Grizzled veterans don't use it because they know better. However, if you are curious, there is a spreadsheet at

http://www.ssr.com/sdb/BAILOUT/Spreedsheets/CoveredCalls.gnumeric

which will calculate all of this for both cash and margin accounts.

2.6.4 Choosing The Proper Return

When comparing returns between various covered call possibilities and other potential investments, the best metric is the return if unchanged. By using the return if unchanged, you can compare returns without speculating on the future of the stock. To compare calls with different amounts of time to expiration, you must **annualize** the returns first. By converting the returns to a yearly rate by annualizing them, you place all the calls on an equal footing and can also compare the returns to the potential yearly yields from other investments, such as treasuries.

Fortunately, this is not a complex calculation. The general formula is:

Annualized Return = Return over period * 365/days in period

Example

Assume the call described in the previous example, which gave a return if unchanged of 17.8%, was held for 90 days before it expired:

Annualized Return = 17.8% * 365/90 = 72%

This is not your yearly rate of return. It would be very unusual to be able to get a consistent enough return every 90 days to make this annualized return your actual yearly return. The purpose of annualizing is to place all investment returns on an equal footing for comparison purposes.

Selecting a minimum acceptable return is a personal choice. You must be comfortable with the return and feel that it compensates you adequately for the risk you take on by owning the stock and selling the calls. And you should remain flexible — as economic circumstances change, you may decide to raise or lower your minimum acceptable return. A return of 1% a month (12% a year) is often suggested as the minimum standard. While 12% a year is nothing to sneeze at (Bernie Madoff became infamous by claiming to make this amount each year), the time may come when less risky investments are available (such

as bonds) that pay 12%. You should demand a higher return in this case to compensate you for taking on the additional risk involved in stock ownership and option strategies.

Market volatility comes and goes — during periods of high volatility, option premiums are often higher. During these periods you should also be encouraged to ask for more. When volatility decreases and the option premiums along with it, you will have to be happy with less, or use a longer time to expiration, or both. My own personal minimum rate, at the time this is written, is a somewhat flexible annual rate of 15%.

2.6.5 Choosing Enough Downside Protection

This is a more difficult problem. The percentage of downside protection, which was given earlier, is a popular metric because it is easy to calculate. However, there are problems with it. Highly volatile stocks, which tend to be riskier, also tend to have much higher option premiums. This means that the percentage of downside protection will always be greater the riskier the stock. This is obviously a good thing, but the problem comes when you try to use this metric to decide if 15% protection on a risky, volatile stock is as good as 6% protection on a less risky stock. There are mathematical ways to deal with this, but introducing those here would take us far beyond the category of a beginners guide to options.

Even if you know the mathematics, it may be that the best course of action remains using your knowledge of the underlying stock to choose the appropriate level of protection. My own personal downside percentages vary from stock to stock. For a very stable stock, I might be happy with 3%. More commonly, I look for 5%. If the stock is extremely volatile, I may ask for 10%. And I have been known to turn to the advanced math techniques on occasion, but this has been a minority of cases.

2.6.6 Combined Writes

As previously discussed, since you can sell an in-the-money option for more money, it will provide greater downside protection. Out-of-the-money calls, with their smaller premiums, provide less downside protection, but can give a much greater return if the stock reaches the strike price of the option. Your investment goals will usually determine which type of call you prefer.

Sometimes option premiums do not cooperate with you no matter what your goals are. The in-the-money options may provide such skimpy returns that even the investor whose primary interest is downside protection will discard them. Out-of-the-money calls may give so little downside protection that even the most aggressive investor decides they are not worth the risk. If you have a large enough stock position, (1,000 shares or more), you can sometimes find a better solution by selling in-the-money calls against half of your position, and out-of-the-money calls against the other half.

EXAMPLE

It's January, and you purchase 1,000 shares of Gorski's Silverado Mine, Inc., for $42 a share. Available calls are the July $40 call for 4-points, and the July $45 call for 2-points. You calculate the returns and downside protection for each call, and here is what you find:

	Return if Unchanged	Return if Exercised	Percent Protection
In-the-money call	5.1%	5.1%	10.5%
Out-of-the-money call	6.0%	12.2%	5.7%

It is hard to be happy with anything here. The conservative investor will be pleased at the 10.5% protection, but will not be happy with the less than 1% return a month for his investment. And even the aggressive investor would feel that a measly 6% return does not compensate for only having 5.7% downside protection. The situation can be improved by selling 5 in-the-money calls against half of your shares, and 5 out-of-the-money calls against the other half:

	Return if Unchanged	Return if Exercised	Percent Protection
Combined write	5.4%	8.4%	8.1%

This provides much nicer potential, with good downside protection and still leaving open the possibility of a more than 1% return per month if exercised. This is an especially useful strategy for low volatility stocks which are stuck between strike prices.

2.6.7 Up to the Minute Summary

Here's the new stuff we've covered:

- You should be neutral or mildly bullish on stocks you choose to sell calls against.
- Do not short calls against stock you are bearish on. You should sell the shares, short them, or use another options strategy to profit from their decline.
- Selling in-the-money calls provides more downside protection.
- Selling out-of-the-money calls offers higher potential profits, but the stock must increase in order to realize them.
- Sell a call with as short a time to expiration as possible, while still meeting your personal criteria for downside protection and minimum expected return.

- There are two returns of interest for covered calls: The return if exercised and the return if unchanged.
- The return if unchanged is the best metric to use for selecting between various call writing possibilities.
- Annualize the return if unchanged before using it to compare calls with different times to expiration.
- The annualized rate of return does not predict your yearly return.
- The percentage of downside protection is easily calculated, but doesn't provide a good basis for comparison between stocks with different levels of volatility.
- Position size influences the returns. Larger positions have a greater percentage return.
- Choosing a minimum acceptable return is a personal and subjective decision. Here are some guidelines:
  1. It should compensate you for the additional risk you take on by owning stock and selling calls. This means it should be higher than the highest rate paid by a safer investment (such as a bond or treasury).
  2. If option premiums increase, you should be flexible and ask for a higher minimum return.
  3. If option premiums decrease, you may need to lower your minimum return or use a longer expiration time, or both.
- Selecting the minimum downside protection is a more difficult problem.
- Your downside protection may need to be different for each stock. Understanding the company is perhaps the best guide to setting your minimum downside protection.

2.7 So You Sold a Covered Call, Now What?

Because options expire and your stock can be called, you need to pay more attention when you invest with options than you do with a stock only position. The easiest course of action is always to do nothing, and this will often result in a profit. But doing nothing will not always be the best course. And should your stock tank suddenly, doing nothing can give you substantial losses.

In this section we will discuss how to handle the situations where your shares make large movements before expiration. section 2.10 discusses what to do when the stock movements occur near expiration.

A word to option beginners: Several times in the next section we will make suggestions to buy back calls you have sold. You may wonder if this is possible — why would anyone

sell them the call at a loss? If you find yourself wondering this, remember that calls are wasting assets — they are not like stock. The person who bought your call a few months ago for 5-points will be very happy to sell it back to you for 1-point, especially if expiration is near, because at expiration they will lose their entire investment.

2.8 What do to if the Stock Goes Down

Your decision should be guided by your valuation of the underlying stock. If the share price decline is because of news which indicates a deterioration in the underlying business and you have become bearish on the stock, the best course of action may be to close the position completely: buy back the calls for a small profit, and sell the shares. But the reasons for a stocks share price decline are not always clear. If you see no substantial reason for the stocks decline, and are still at least neutral on the stock, it is probably better to sell more time value.

To sell more time value, first buy back the call you sold and then sell a new one, with a different expiration date and/or strike price. Many brokers allow you to do this in one step, which can result in better prices and lower commissions. Utilize this feature if they offer it. Since the stock has declined, the original call will be worth less now, which means you can buy it at a small profit. Replacing the current call with a new one is called **rolling**. Various terms are used to describe various types of rolls:

Roll Forward: The current call is replaced by one with a later expiration date.

Roll Up: The current call is replaced by one with a higher strike price.

Roll Down: The current call is replaced by one with a lower strike price.

Various combinations of these are possible - for example, **rolling forward and down** replaces the current call by one with a later expiration date *and* a lower strike price.

2.8.1 Rolling Down

Since the stock price has declined, you should roll down. Whether you should also roll forward to a later expiration date depends partly on how much time has passed since you sold the first call, and partly by the current option premiums.

Example

You buy shares of Arlo's Political Cartoons, Ltd. at $32, and sell a April $30 call against your ARLO shares for 6-points. Two months later, ARLO shares have declined in price, and your calls will have dropped also. Here's your situation:

	Opening Position	Current Position	Gain (loss)
Stock	32	25	(7)
April $32 Call	(6)	(1)	5
Maximum Profit	4	4	
Break-even	26	26	
		Net Gain (loss)	(2)

You have a net loss in this position of 2-points. You have lost 7-points in the stock, which is offset by by a 5-point gain in your call.[3] If you hold on to the present position, the most you can make is 1-point from further time decay in the call. And the stock may decline even more by that time, offsetting even this small improvement.

You find an April $25 call selling for 4-points. You decide to roll down. You buy back your April $30 call at a cost of 1-point, and sell the April $25 call for 4-points, for a net profit of 3-points on this transaction. This improves your downside by 3-points, moving it to $22. Here's the new position:

Stock	25
April $25 call	(3)
Maximum Profit	3
Break-even	22

Note that in this position, as long as the shares stay above $22, you stand to make an additional $300 dollars by expiration — much more than the $100 additional you could make by sticking with your original position.

To get a better picture of your total profits at expiration, here is a table comparing the profits from the original position with the rolled position at expiration:

ARLO shares at expiration	Profit from April $30	Profit from April $25
20	(600)	(200)
22	(400)	0
25	(100)	300
26	0	300
28	200	300
30	400	300
40	400	300

Obviously the rolled down position has a smaller maximum profit potential than the original. By rolling down, you have obligated yourself to sell shares at a lower price. *Rolling down generally reduces the maximum profit potential of a covered call.* However, when your

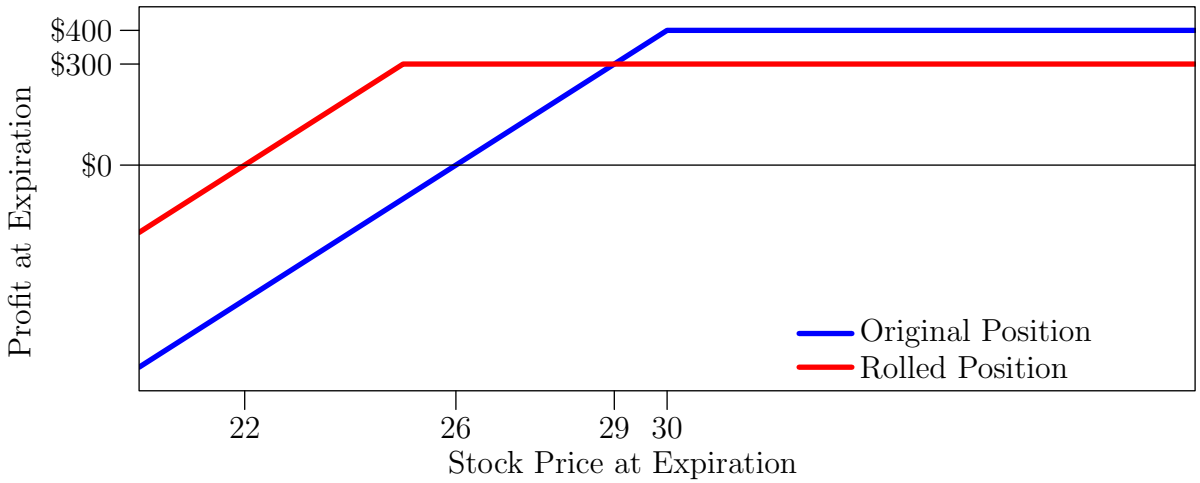

Figure 2.3: Profit graph of original and rolled positions.

stock is declining, you will usually be more interested in protecting your downside than in additional profits.

Figure 2.3 shows the profit graphs of both positions. Notice that the lines cross at the share price of $29 — this is where the profits from the two positions are equal. Everywhere to the left of that point, the rolled position outperforms the original position. Everywhere to the right, the original position outperforms the rolled position. If the shares rally above $29 by expiration, you would have been better off not to have rolled.

If the price decline in the stock is both sudden and steep, you may not be able to find an option to rescue you. This results in a **locked-in loss**. This is especially likely to occur in lower priced stocks, where the strikes are spaced farther apart. Out-of-the-money calls tend to have this problem more often than in-the-money calls. Even though you may not be happy at losing money, you may lose less by rolling down:

Example

You buy ARLO at $20, and sell the March $20 call for 2-points. ARLO shares suddenly plunge to 16, with the March $20 call now selling for 0.5-points. Here is your situation at present:

	Opening Position	Current Position	Gain (loss)
Stock	20	16	(4)
April $32 Call	(2)	(0.50)	1.5
Maximum Profit	2	2	
Break-even	18	18	
		Net Gain (loss)	(2.5)

[3]Why a 2-point loss, when the stock is only 1-point below break-even? Because the break-even point is calculated assuming expiration, when the time-value is zero. In the present situation, there is still 1-point of time value left in the call.

This gives a 4-point loss on the stock, offset by a 1.5-point gain on the call, for a net loss of 2.5 points.

The next lower strike price is $15, where the March $15 is selling for 2.5-points. You could roll down for a credit of 2 points (2.5 - 0.5 = 2), but then you must sell your stock at $15 if it is called. This is not a very happy solution, because if you roll, the very best you can do is to lose 1-point.

Such is the pain of a locked in loss. Even though rolling is painful, not rolling may be worse. Here's a table comparing the two possible outcomes at expiration:

ARLO shares at expiration	Profit from March $20	Profit from March $15
10	(800)	(600)
15	(300)	(100)
18	0	(100)
20	200	(100)
25	200	(100)

Unless the stock rallies above $17 by expiration, it is better to have rolled and lost, than not to have rolled at all. As you can see from Figure 2.4, the red line, which represents the

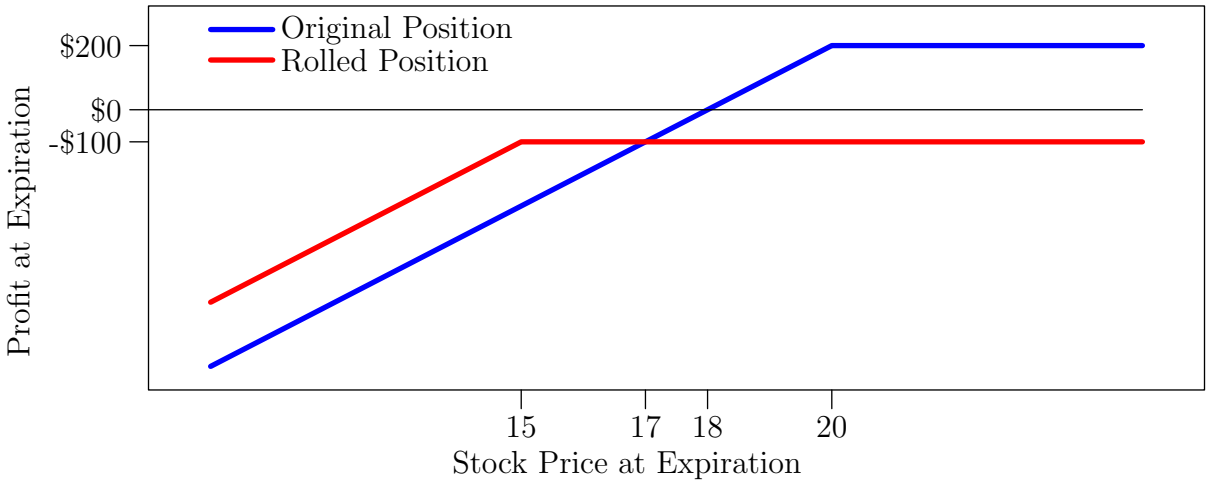

Figure 2.4: A "locked-in" loss..

rolled-position, is always below the break-even line, which graphically illustrates the locked-in loss. The two lines intersect at the stock price of $17. The rolled position does better everywhere the stock is less than $17, and the original position does better everywhere the stock is higher.

Low-priced, non-volatile stocks are the ones most likely to get you into this sort of situation. Use extra care if with these if you decide to write covered calls on them.

2.8.2 Rolling Forward and Down

In practice, it is common to roll the call both down and also forward to a later expiration date. As discussed in subsection 1.2.3, a call which is farther away from expiration will cost more because of the additional time value. This means you will be paid more when you sell it.

In spite of the extra money, rolling forward may not be a very good idea. As we saw in section 2.8, when you roll down, you also reduce your maximum profit potential. When you roll to a more distant expiration date, often all you manage to do is to slow your return to profitability. The more distant expiration dates should be only be used if you are concerned about further price reduction in the stock and need that much downside protection.

When you are faced with a locked-in loss, the higher premiums offered by the more distant call options can be especially appealing. But the distant options also lock you into a lower strike price for a longer period of time. It often works out better when you sell several short-term calls instead of one long-term call. By repeatedly harvesting the premiums from the shorter-term calls, you can return to profitability in the shortest possible time, and possibly escape the locked-in loss.

2.8.3 Partial Rolls

If you have a large position (at least 500 shares, but 1,000 shares or more is better) and find yourself facing a locked-in loss, the **partial roll down** may be useful. In this strategy, only a portion of your shares are rolled down:

Example

You buy 1,000 shares of ARLO for $20 a share (spending $20,000), and also sell 10 March $20 calls for a premium of 2-points (receiving $2,000.) This is exactly the same situation as in the previous example, but with a much larger position. The position size won't help you — if you rolled all the calls, you would still end up with a locked-in loss.

As before, with ARLO drops suddenly to $16, the March $15 calls are now selling for 0.5-points. Instead of rolling all 10 calls, you roll only 5. You buy back 5 $20 calls for 0.50 points each, and sell 5 $15 calls for 2-points each. As will be shown, this avoids the locked-in loss scenario.

If the stock moves back above $20, unlike the complete roll-down where you will be left with a locked-in loss of $100, the partial roll-down allows you a gain of $500. To see this, just add all the transactions together assuming the stock moves back above 20 by expiration:

Description	Amount
Initial Purchase:	
Buy 1,000 shares @ 20	($20,000)
20 Jan. $20's @ $2	2,000
Partial Roll Down:	
Buy back 5 Jan.$20's @ 0.50	(250)
Sell 5 Jan. $15's @ $2.50	1,250
Stock Rallies above 20:	
Sell 500 shares @ 20	10,000
Sell 500 shares @ 15	7,500
Net profit	$500

Figure 2.5 shows the graphs of all three positions. The loss is no longer locked-in, and a profit can result on a rally. Furthermore, the shares need only return to $19 to break-even. The partial roll does not have as much protection as the original position, but it gives better protection than not rolling at all.

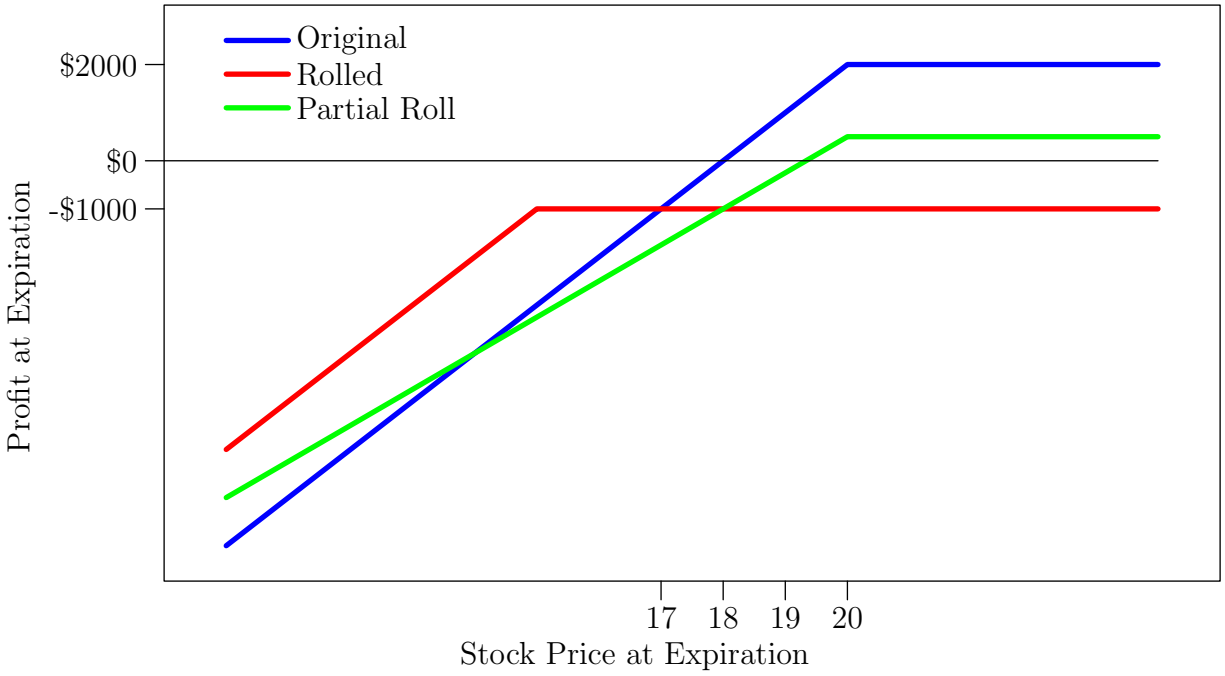

Figure 2.5: The effects of not rolling, rolling down and partially rolling down.

With partial roll-downs, it becomes an advantage to roll forward and down in order to harvest larger premiums. Since you are no longer locked into a loss, you do not need to be concerned about locking yourself into a losing position for a longer period. You are ready to make profits if the stock rebounds, and take full advantage of the additional protection offered by also rolling forward to a later expiration date.

Should the stock continues to drop and you there seems to be no hope for an immediate rally, you can always roll the rest of the position down.

2.8.4 Buying a Put

For the sake of completeness, it should be mentioned that it is also possible to protect a covered call position by purchasing a put. Since we are focusing on calls in this part of the book, this tactic will be discussed later. The interested reader is referred to section 9.4.

2.9 What to do if the Stock Goes Up

A nicer problem to have is when the stock rises in price after selling the call option. There are basically three alternatives:

1. Roll up
2. Close the position early.
3. Do nothing.

2.9.1 Rolling Up

Example

You buy ARLO shares at $30 and sell an at-the-money 6-month call for 6-points. This gives you a maximum profit at expiration of 6 points anywhere above $30, and a break-even price of $24.

ARLO is finally receiving respect from investors, and instead of dropping, the shares surge, climbing to a new high of $40 a share. Since the stock has climbed $10, you might expect your call to go up by the same amount, but that will occur only near expiration. With many months remaining before expiration, your 6-month $30 call will perhaps increase by only 5 points, and be worth around $11. Out-of-the-money calls with higher strikes will also see their premiums rise — the 6-month $40 call might be selling for around 7-points.

You can roll up to the $40 by buying back the $30 call and selling the $40 call. Unlike roll downs when you receive additional credits, roll ups cost you. This one costs 4 points:

Sell the $30 call for 6-points:	6
Buy the $30 call back for 11 points:	–11
Sell the $40 call for $7 points:	7
Net Points remaining after roll:	2

Since you started with 6 points, and now have 2, you gave up four points for the roll. What you gained in exchange is increased potential profits. Here's a comparison of the two positions if ARLO is above $40 at expiration:

	$30 Call	$40 call
Option Profits	$600	$200
Stock Profits	0	1,000
Net Profits	$600	$1,200

The profit graph in Figure 2.6 compares the original position with the rolled up position. As you can see from the graph, rolling can dramatically increase the potential profit, but at

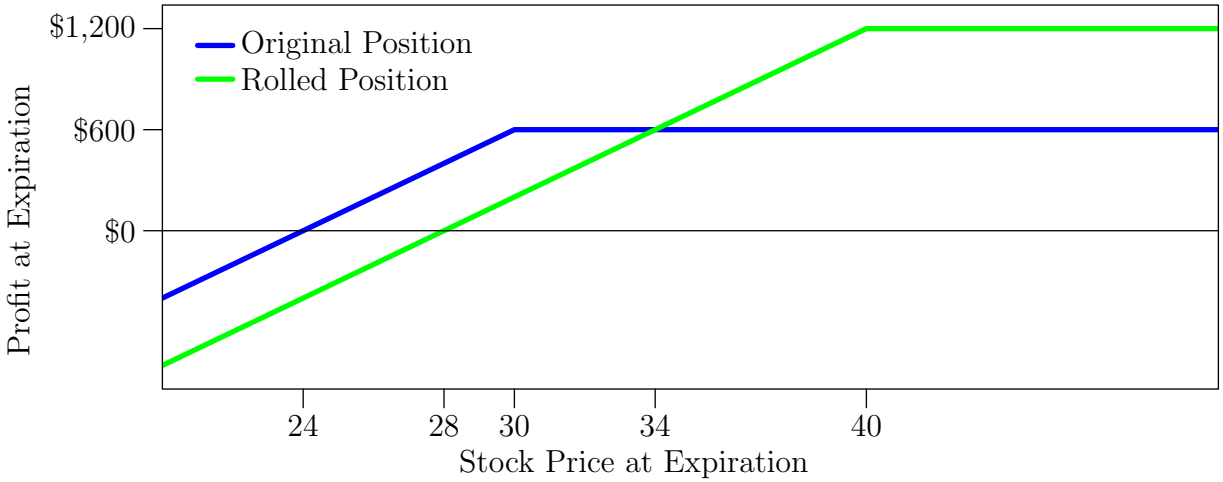

Figure 2.6: Comparison of rolling up with holding the original position.

increased risk. *When you roll up, your break-even point will always be increased by the net debit you pay to roll.* It cost us 4-points to roll up to the new position, and as you can see, the new break-even point is 28 — 4 points higher than the original position. Essentially, by taking a 5 point loss on the original call (selling it for 6 points, then buying it back for 11 points), you have added 5 points to the price of your stock. So the rolled up position is the same as if you bought the shares at $35, then sold the $40 call for $7. So the new break-even point must be $35 - $7 = $28, and the new maximum profit must be $40 - $35 + $7 = $12. If, in addition to rolling up you also roll forward, you will get a bigger premium. This reduces the cost of the roll and increases your downside protection. It also gives more time for the stock to move in your favor.

The intersection of the two lines, which is where the two positions are equally profitable, is particularly important for roll ups. While the profit potential is appealing, you need to consider how likely it is that the stock may move back down from $40 to $34. This would be a 15% drop, which may or may not be likely to occur before expiration. If you think it is very likely that the stock could fall this much before expiration, it is best to stay with

the original position. As a rule of thumb, 10% movements are quite common, but a move of 20%, while rare, is not unheard of, even in healthy companies.

Remember that rolling up incurs additional risk. When you entered the position, you chose it based on your minimum requirements for an acceptable return. If the stock moves up and your minimum return requirements are being met, think carefully before risking them. On the other hand, many investors have a negative emotional reaction to spending more money on a position they have already established. Strive to evaluate the situation as rationally as possible. While you shouldn't chase illusory profits, do not let your emotions scare you away from investing more if you conclude that the stock is likely to reach higher levels.

2.9.2 A Word of Warning

Investors often roll irrationally because they are overly attached to a stock and can't stand the thought of losing it. Such investors may roll up the second the stock reaches the strike price of their short call. Rolling up costs money, and if the stock is moving powerfully upwards, these repeated debits can weigh heavily on such an investors emotions. When they can't stand it any longer, after spending so much to get to where they are, they will just buy back all the calls at a large debit. Of course, as any investor knows, after a strong rise by a stock, a fall is likely and it is usually sharp and painful. So after buying back all their calls and leaving themselves exposed to downside risk, they will often see their overly loved stock fall back to much lower levels. The best way to avoid this situation is to always follow rule number 1:

Rule Number One: Never sell a call against shares that you really want to keep.

But should you break rule number 1, and probably we all have at one time or another, the way out of this situation it is to allow your stock to be called away for a nice profit. Bid it a tearful farewell and use the money to go to Cancun. You'll always have your memories of each other.

2.9.3 Closing Early

As the stock rises, the intrinsic value of the call will rise. If the rise is dramatic, the call may lose its time value and begin to trade near parity.[4] In this situation, it is often best to close the position early.

Example

ARLO shares were purchased at $25 and a six month $25 call was sold for 3-points, for a maximum potential profit of $300. Within a month or two, much sooner than expected,

[4]Recall from Chapter 1 that an option is at **parity** when the call premium is equal to the intrinsic value of the option.

ARLO rises to $33 and the call is trading at 8-points (parity). If you now decide to close the position, you will spend $8 to buy back the calls, and sell the stock for $33, giving you an effective sale price of $25. You keep the option premium of $300, which is your maximum profit.

The advantage of closing early is that you realize your maximum return in a much shorter time than expected. This will push your annualized return well over your minimum requirement. The cash received can then be redeployed in other investments. While rolling up is a possibility that can also be considered in this situation, closing early is clearly better than hanging on to the position for another 4 months with no additional profit possible.

You will be paying some additional costs for this. There will be extra commission costs and if there is a dividend due, you may not receive it. In most cases this will not be significant, but should always be taken into account when making your decision.

Most brokers will accept orders to sell the stock and buy back the call as one order. This is usually to the investors advantage, as it can save in commissions and result in better prices.

2.9.4 Doing Nothing

For some investors, doing nothing is the most difficult thing of all. However, if there is no compelling reason for rolling or closing early, leaving well enough alone is the best course.

2.9.5 Up to the Minute Summary

- If the stock declines in price before expiration, you can:
  1. Roll down and/or forward.
     - Rolling down reduces your profits but increases your downside protection.
     - Rolling down can lock-in your losses. This may still be better than leaving the position alone, due to the increased protection you receive.
     - Rolling down and forward may be considered. It can further increase your downside protection, but will lock you into lower potential profits for a longer period.
     - By not rolling forward, you can sometimes recover more quickly from a locked-in loss by selling more short-term calls to lower your cost basis.
  2. If you have a large position (1,000 shares or more), you can do a partial roll.
     - Partial rolls avoid a locked-in loss, but have reduced downside protection when compared to rolling down the entire position.
     - When you do a partial roll, rolling forward becomes more reasonable, since you have left open the possibility for upside profits.

- If the stock increases in price before expiration, you can:
  1. Roll up and/or forward.
     - It will cost you some money to roll up.
     - Rolling up raises your downside break-even point by the amount of the debit you pay.
     - Rolling forward and up is often a good thing to do in this situation. It can reduce the net debit you pay which will also give you more downside protection.
     - You should only roll if you feel the movement of the stock can be sustained. If a 10% move seems likely and will bring you back to the point where the original position and rolled position have the same returns, stay with the original position.
     - Do not roll up in a desperate attempt to hold on to a stock you do not wish to sell. You probably shouldn't have sold calls against this stock to begin with.
  2. Close Early
     - Closing early should be considered when the call is trading at or near parity.
     - The advantage of closing early is that it increases your annualized returns well over your personal minimum.
     - Consider what you may lose when you close early in making your decision. Consider total commission costs as well as any dividends you may miss by closing the position.
     - If you do close early, having your broker close the complete position can save commissions and get you better prices.
  3. Do nothing.
     - This can be the most difficult choice for some investors.
     - Absent a compelling reason to take another action, doing nothing is the smartest thing to do.

2.10 Actions to take at Expiration

Congratulations, you and your option have made it nearly to expiration. The time value premium is disappearing more and more rapidly from your short call. Now what?

2.10.1 Rolling Forward

You may wish to roll forward, to a later expiration date. If your call is in-the-money, the perfect time to roll forward is when the time value has completely disappeared from the call. As long as there is time value left in the call, even though the option is in-the-money, there is little risk of assignment. And you are still earning money as the time value decreases. But if the option begins to trade at parity or below parity, early exercise becomes likely. This is due to arbitragers, who can make a profit on calls which sell at a discount to parity.

Example

ARLO shares are trading at $26, and your $25 call is selling for 1-point (it is at parity). You should definitely roll this call.

If your call is out-of-the-money, the situation is not so clear. One way to approach this situation is to calculate the return per day you will receive by continuing to hold the call with the return per day from the later-term call. If the later-term call has a higher return, then rolling forward is probably a good idea.

Example

You are one month from expiration, and have an out-of-the-money call which is selling for 0.5-point. There is a call with the same strike that expires in four months which is selling for 2.5-points. Should you roll forward?

By remaining with the current call, you will make $50 in the next month (assuming it stays out-of-the-money and expires worthless). This is $1.67 per day. Since the time premium in the new call is $2.50, you will potentially make $250 in four months. To properly compare the roll forward with just holding the original call, you need to include commissions. Let's say that the commission for rolling forward is $10.50. (250–10.50)/120 comes to $2.00 a day, so you should probably roll forward to the new call.

When doing these calculations, you should use the amounts from your total position, and not just single calls. This is because returns increase with greater position size, so a position that might not be worth rolling forward if you only own one call might be worth rolling forward if you own several.

Example

As in the previous example, you are one month from expiration, but you own 10 out-of-the-money calls with each selling for 0.5-points. Should you roll to the later dated call which is selling for 2.5-points?

The current calls will make you $500 in the next month, which is $16.67 per day. The longer term call will make you $2,500 in four months. Commissions for trading more calls are typically higher, so the commission cost for this example will be $16.50. (2500-16.50)/120 is $20.70 per day.

Rolling forward, being a net credit transaction, will always increase your maximum profit and give you more protection by lowering the break-even point.

2.10.2 Rolling Forward and Up

At expiration, you have little choice but to roll forward. It may also be an advantage to roll up as well. Note that if your calls are out-of-the-money, the approach used in subsection 2.10.1, where we compared the returns from each call, can't be used as the only basis for your decision if you are also rolling up to a higher strike price.

If you are near expiration and your call is in-the-money, you *must* roll forward and up if you want to keep your shares. Near expiration, especially with a volatile stock, you may be able to roll up for a credit, (recall that rolling up usually involves a debit). If you find yourself in this situation, make sure you take advantage of it.

EXAMPLE

You own $25 calls on Peter's Lengthy Endpins which are in-the-money and selling for 5-points. PETER's stock is at $28, and there is a three-month call with a strike of $30 which is selling for 7-points. This means you can roll your calls up and earn an additional 2 points. It would be extremely foolish not to take advantage of this. You improve your maximum profit potential by 7 points and reduce your downside risk by two points.

2.10.3 Rolling Down

This situation often occurs just after expiration when a call has just expired worthless. If the stock has not moved much below the strike, the decision is not so difficult. However, the stock may have dropped substantially below where it was when you sold your previous call. If that is the case, you need to decide whether to wait for the stock to recover before selling more calls, or sell new calls with lower strike prices immediately. Your decision, as always, should be based on the companies performance. If there is a good reason for the decline, exiting the position may be best.

EXAMPLE

Peter's Elite Endpins (ticker symbol: PEE), has dropped to $22. Your $25 call has just expired worthless for a 100% cash gain. You have a choice of two 3-month calls, an

in-the-money $20 call with a premium of 3.5-points, and an out-of-the-money $25 call with a premium of 0.75-points.

If you think PEE's price decline is temporary, you should consider the $25 call. Even though the premium is small, the maximum profit would be large if PEE returned to $25 by the new expiration date. On the other hand, if you are concerned about further price decline, the $20 call provides a lot of downside protection, and its time-value premium (1.5) is twice what you get from the out-of-the-money $25. You'll undoubtedly wish to consider the price you spent for PEE as well. Waiting until the stock recovers is also a possibility. Other considerations involve tax issues surrounding selling in-the-money calls.

It's impossible to give one rule that applies to all situations. As always, when selling covered calls, try your rational best to strike a balance between protection and profit.

2.10.4 Letting Your Stock be Called

In general, your best course of action when your covered calls approach expiration is to harvest more premiums by rolling forward or forward and up. If you are able to do this, your total return over time will be higher.

However, if the stock has reached the point where you regard it as over valued and due for a correction, you may be better off allowing it to be called. Some people sell calls in the hopes that they will have their stock called at a higher price and get paid a few more points above market for shares they would want to sell anyway. I have tried this a few times with dubious results. It is not clear to me that this strategy for selling a stock results in superior returns.

You sometimes find yourself in a situation where rolling forward provides a minimal return. In such cases, you may be tempted to roll-up as well. If rolling up decreases your protection to a point where you are uncomfortable with it, then the best course of action is to let the shares be called, and find another investment. This second point is also related to your valuation of the stock and its future potential.

2.10.5 Up To The Minute Summary

- In-the-money calls trading at or below parity should be rolled forward (and possibly up), to avoid early exercise.
- Out-of-the-money calls should be rolled forward if the return per day of the new call (including commissions) is greater than the return per day left in the existing call.
- If you have the chance to roll forward and up for a credit near expiration, do so.
- If the stock has dropped in price, you might consider a new call with a lower strike price. Balance your decision rationally considering downside protection, returns, and the health of the company as well as the valuation of the stock.

- In some cases, especially when rolling produces returns which are below your standard, and protection is also reduced, it may be best to allow your stock to be called.

2.11 Philosophies of Covered Call Writing

Now that you have the basics of covered call writing under your belt (and a lot of the subtleties too!), it's time to turn to the bigger picture.

You can identify four broad philosophies of covered call writing (five, if you count the people who are opposed to it). These are:

1. The shareholder who also writes calls philosophy.
2. The total return philosophy.
3. The option only philosophy.
4. The incremental return philosophy.

It's certainly possible to adopt one of these philosophies as your own, and view the others as mistaken — many investors I know place themselves in one of these three groups. Speaking only for myself, I think all these schools of thought have merit, and I use all of them in my own investing.

2.11.1 The Shareholder Philosophy

Those who have spent a lot of time and energy building a portfolio of good stocks are naturally going to wish to protect them, and often do not wish to be in a position where they must surrender them at options expiration. At the same time, they are also drawn to the additional income that covered call writing can provide. People who hold to this line of thought will be drawn to writing out-of-the-money options for the premiums, since these are less likely to cause the stocks to be called.

While other philosophies may thumb their noses at the lower premiums such investors accept, there is actually some mathematical basis to believe that moderately out-of-the-money short calls can provide the highest returns. And since such investors are comfortable owning their stocks at the shares current price levels, they do not concern themselves as much with downside protection. They may also buy back short options early for quick profits if such profits show up during the life of the call.

You may have shares in your portfolio of companies you know well, have researched carefully, and held for a long time (or hope to hold for a long time). Especially when these companies reach their fair value price, or become somewhat over valued, you might consider selling calls against them to make more money.

In the traditional value-investor approach, (and I consider myself one), a fairly valued stock is either sold, or held because it pays a dividend. In my opinion, covered calls

represent a viable alternative strategy to simply selling the shares when the reach fair value. After all, a good company (like a good man or woman) is hard to find. When you sell your shares, you need to look around to find some place else to put your money. Why not make a little with it while you look?

2.11.2 The Total Return Philosophy

Others feel that you need to view the call options plus shares as a total position. These investors tend to favor in-the-money short calls due to their higher premiums and greater downside protection. They are unconcerned if the stock is called as long as their objectives have been met.

Traditionally oriented investors tend to think that the total return guys are not concerned enough with fundamentals. I'm not sure that's true, but a concern with the underlying stock is not inconsistent with this view. They are also troubled by total return investors tendencies to buy stock for the purpose of profiting from writing calls against them.

Absent a better investment, I don't see the problem with, for example, buying shares of a strong company which are trading at the low end of their value range, and making money on it by selling calls against it. I've done this many times with excellent success. While I wouldn't buy these shares as a long-term investment, they represent solid value and if you can recognize the value and turn it into a cash stream, why should anyone have a problem with that?

If you do try buying shares just to write calls against them, see if your broker has a "buy-write" option, where they buy the stock and sell the calls at one time. Like rolling, doing both through the broker in one order can reduce commissions and provide better prices.

2.11.3 The Options Only Philosophy

There are those who only use options. These people feel that they can make the most money by using more complex option strategies, such as spreads, rather than buying shares of stock. There is a lot to be said for this point of view as well, even though that may horrify readers who are long-term buy and holders only. Options can leverage your return and reduce your risk, and many of the ways they can do this do not involve any stock ownership at all.

In my view, combining this with the traditional value investors discipline of understanding the underlying companies only makes it a more viable approach. It is also quite a bit of fun. But they miss out on good opportunities because they never want to own stock, and so can't write covered calls.

2.11.4 The Incremental Return Philosophy

This is part philosophy and part strategy, and is used by well heeled investors. To do it, you need at least 500 shares of stock, with 1,000 or more preferred. You decide on a price

which represents your sale price for the stock. It's best if this sale price is based on an understanding of the fundamentals of the company, rather then being plucked from the air.

You begin by selling calls against only part of your position. You sell long term calls at the strike closest to the current price of your shares. If the stock moves above this, to the next strike above, you roll these calls up, and then sell additional calls at this new strike price until you have a net credit from the total transaction. Generating a positive cash flow at each roll is the key to this strategy. Eventually, your entire position will have calls written for it at your target price, and will be called away, giving you capital gains from the stock as well as the accumulated option premiums.

Example

Gorski's Silverado Mining Corp. is selling for $30, and you own 1,000 shares. You think a fair price for this stock is $50. You begin by selling 3 of the longest term calls you can find for $7 each. You make $2,100 from this transaction.

One month later, Gorski's Silverado Mining has risen to $40. Your original $30 calls are now selling for $10, and the long term $40 calls are selling for $6. You buy back the three $70 calls for a net debit of $3,000. Now you must sell enough new calls to turn this into a new credit, so you sell 6 long-term $40 calls for $3,600. You make $600 from this transaction.

A new month, a new share price. Gorski's Silverado Mining is now selling for $50, your target price. The $40 calls are now selling for $10, and the long-term $50 calls are selling for $7. You buy back all 6 of the previous calls for $6,000, and since your target price has been reached, you sell 10 $50 calls against your entire position, for $7,000. You make $1,000 from this transaction.

At this point, you have made $2,100 + $600 + $1,000 = $3,700 in option profits, and when your stock is called, you will make an additional $20,000 in stock profits.

This strategy tends to work better than longer it is drawn out, as the option premiums are allowed to accumulate. As such, it is well suited to a low volatility, flat market. Should one of the interim calls lose its time value premium and therefore become a candidate for early exercise, you simply roll that fall forward to an even later date. This will increase the option premiums also.

2.12 Chapter Glossary

Buy to Open Open a long option position.

Covered Call A short call position combined with a long position in the underlying stock.

Short Position Selling stocks or options that you do not own.

Shorting The act of selling stocks or options that you do not own.

Rolling Trading a call with a current strike and expiration date for another one with a different strike and/or expiration date.

Rolling Down Trading a call you own for a call with a lower strike price.

Rolling Forward Trading a call you own for a call with a later expiration date.

Rolling Up Trading a call you own for a call with a higher strike price.

3 Buying Calls

This chapter assumes you are familiar with the basic concepts of options discussed in chapter 1.

3.1 Advantages of Long Calls

This is the easiest to understand of all option strategies, and is probably the most commonly used. The primary appeal of buying call options is *leverage*. If you purchase your calls wisely, a large percentage return can be obtained. If the stock does not move as you hope, your total lost is limited to the amount you spent on the call. Since this is always a much smaller amount than you would spend on an equivalent amount of stock, buying calls holds great appeal.

Example

Gorski's Silverado Mines shares are selling for $58, and a six-month, $60 call is selling for 3-points. For the modest investment of $300, you can share in any profits generated by the shares for a period of six months. Should Gorski's Silverado shares rise to $68, your call would be worth around $800. This is 167% profit from a share price increase of 17%. You can see the appeal of this, I'm sure.

On the other hand, if Gorski's shares were to drop to $48, and stay there until expiration, you would lose your entire investment of $300. But the purchaser of 100 shares of Gorski's at $58 would have lost $1,000. I'm sure you can see the appeal here too. Even though you have a 100% loss, the dollar amount is small.

Another common use of long calls is to "lock-in" the price of a stock:

Example

Shares of Dotties Dainties are selling for $28. You feel these shares are poised for a huge movement to the upside, but most of your investible cash is tied up in a bonds which will mature in two months. You buy 5 $30 calls for 2-points each which expire in 3-months.

Fast forward two months, and your bonds mature, giving you $15,000 in cash. Shares of Dotties Dainties are now selling for $60, and still represent a good value. You exercise your calls, and obtain shares valued by the market at total of $30,000 for $16,000, excluding commissions.

Note that you must include the price you paid for the calls in the calculation of your stock basis (this is also the amount you report to the IRS). Since you paid 2-points for the calls, your effective share price is $32, for a total of $16,000 for 500 shares.

You can use variations of this strategy:

EXAMPLE

Shares of Dotties Dainties are selling for $28. You can't afford them, but are sure they represent a great opportunity. You buy 10 $30 calls for 2-points each, which expire in 3-months.

As before, in two-months the shares have risen to $60. Your calls are now worth 33-points. You sell half of your calls for $3,300 each. Now you have enough money to pay for the exercise of your other 5 calls. You have essentially obtained 500 shares of Dotties Dainties without using any of your own money.

3.2 Disadvantages of Long Calls

While the potential returns from long calls may be exciting, it is very hard to do well. You must be right about the underlying stock and the market must also agree with you before the expiration date of the call. To pick the right stock is certainly one of the most difficult challenges an investor faces, and timing the market is notoriously difficult. Most option strategies try to remove some of the precision required for picking stocks. But buying a call, even more than buying stock, leaves no room for error.

It is also possible to buy the wrong call on the right stock. The stock may rise, but for reasons mysterious to the investor new to options, the call does not cooperate. The apparent simplicity of the strategy is deceptive. There are subtleties to buying calls which you ignore at your peril.

3.3 General Considerations for Stock and Call Selection

The best friend you have when you buy calls is the underlying stock. No matter what call you purchase, if the underlying stock does not increase in price, your call won't either. While the long-term shareholder can wait patiently for their profits, the call buyer does not have this luxury. It will do you no good to see the stock rise after the call has expired. The fundamentals of the stock are important as always, but to be right with a call, there must be also be a catalyst which will move the share price. Typical examples are patent case rulings, or FDA approvals of new drug applications. Cyclical industries can provide

opportunities, particularly for long term calls. Increased market volatility will increase the price of your calls, but it is impossible to know when she will pay you a visit.

The returns from out-of-the-money calls are potentially much larger than from in-the-money calls. But to actually put this money in your pocket, the stock price must appreciate. So while the in-the-money call's returns are smaller, they are also more likely to be realized.

Do not make the common and potentially serious mistake of buying a call based on its price. Out-of-the-money calls always have smaller premiums than in-the-money calls. It may cost you less, but with an out-of-the-money call, you are spending all of your money on time value, which can evaporate even as the stock increases. When you purchase an in-the-money-call, you are buying at least some intrinsic value.

Example

Shares of Xaio-Mei's Worthy Pens are selling for $45 a share. The six-month $40 call sells for 7-points and the six-month $50 call sells for 3-points. If Xaio-Mei shares take almost 6-months to advance to $49, the buyer of the $50 calls are certain to experience a loss, because of time-value decay. However, the in-the-money $40 calls will have increased point-for-point with the stock, and will sell for slightly more than $9, the intrinsic value of the call option.

Obviously, the in-the-money call is much less risky. The shares would have to drop 5-points by expiration before the $40 call buyer would lose their investment. But the out-of-the-money buyer must rely on the stock appreciation to merely break-even. Obviously, the probability of a complete loss is much greater with an out-of-the-money call.

3.4 Specific Considerations for Call Selection

3.4.1 The Delta of an Option

Let's review the basics of time value and time value decay:

1. Time value is highest at the strike price.
2. Time value is smallest when the option is deep-in-the-money or deep-out-of-the-money.
3. Time value decay is not linear — the rate of decay increases as the option nears expiration. Most of the decay is in the last few weeks of the options life.

If any of this is unclear or unfamiliar, please review subsection 1.2.3 on time value and especially subsection 1.2.5 on time value decay.

The **delta** of an option is considered an advanced concept, with mathematics to match. However the basic idea is simple:

> The **delta** of an option is the amount by which the call's premium changes as the underlying stock moves up and down in price.

For example, if a call option premium goes up $0.50 each time the underlying stock goes up $1.00, the delta of that option is 0.50.

While the mathematics behind the delta are forbidding, there is a simple geometrical explanation that is easy to understand. If you were to lay a ruler along the option price curve and draw a line with a pencil so that it intersects the price curve at a single point, then the steepness, or *slope* of the penciled line is the delta of the option at that point[1].

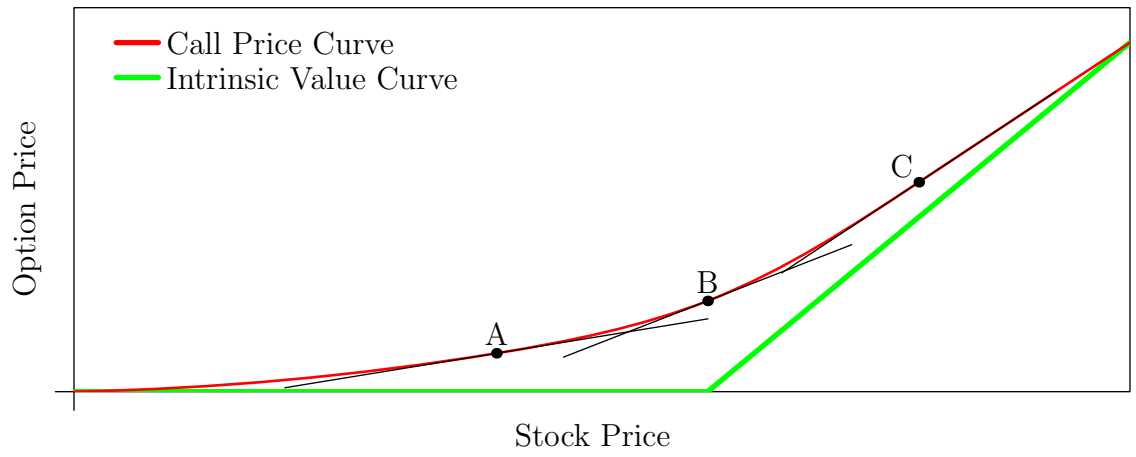

Figure 3.1: Option Price Curve (red) with intrinsic value line (green) and deltas at points "A", "B" and "C".

You can see this in Figure 3.1. The slope of the line at point "A" is much less steep than the line at point "C". "A" is closer to the horizontal part of the intrinsic value line, while "C" is closer to the angled part of the intrinsic value line. Point "B's" slope lies somewhere between them. All intrinsic value line's have a slope of zero below the strike, and a slope of one above it. Since the price curve almost merges with the intrinsic value line at its end-points, both lines must have nearly the same slope at these points. This makes it easy to estimate the delta for these cases, which correspond to the option being deeply-in-or-out-of-the-money. For the deep-out-of-the-money case (at the far left of the curve), the delta must be nearly zero. For the deep-in-the-money case at the far right, the delta must be nearly one. At the strike, which has a slope between the two, the delta will be around one-half[2].

This means that the premium of a deep-in-the-money call, with a delta of very nearly one, will move nearly in tandem with the stock. If the stock moves up by one point, the

[1] You may remember from your math courses that the pencil line is also called the **tangent** to the curve.

[2] The mathematically inclined reader has probably noticed that the delta is just the first derivative of the option's price curve function. The mathematics of the price curve involve differential equations which are reasonably interesting, but a discussion of such topics doesn't belong here.

option premium will move nearly one-point up. On the other hand, a deeply out-of-the-money call, whose delta is nearly zero, will move very little even if the stock moves several points up or down. It takes a large movement in the stock to budge the premium of a deeply out-of-the-money call. When a call is at-the-money (delta of about 1/2), a one point movement in the stock would cause a 1/2-point move in the option premium.

The delta of an option changes constantly, microsecond to microsecond, as the stock price changes. In practice, you can assume that for most cases, the delta of an option remains constant over the short term. This works because for the typical option price curve, a sufficiently small section of the option price curve is very close to a straight-line, which has a constant slope.

The delta is a useful piece of information for the call buyer who wants to profit from a short-term movement by the stock:

Example

You find a stock which is selling for $27.50 and you are expecting it to rise quickly, but not very far. Should you buy a $25 call for 3.5-points or a $30 call for 1-point? The stock price, being precisely between the two strikes, is not much help. You take a look at the deltas of each call: the delta of the $25 call is 0.625, while the delta of the $30 call is 0.25.

Let's ask ourselves what would happen to the calls if the stock rose to rapidly to $29. This is a 1.5 point increase in the stock. The $25 call would therefore increase by $1.5 \times 0.62 = 0.9375$, and now be worth $3.5 + 0.9375 = 4.44$.

The same 1.5 increase in the stock would cause the $30 call to increase by $1.5 \times 0.25 = 0.375$ making the call worth 1.38-points. This is an increase of almost 38%. In this case, the out-of-the-money call would be a better investment. (Commissions are omitted here for the sake of clarity, but should be included in a real example.)

3.4.2 The Time Frame of the Investment

Both the delta and the relationship of the strike price to the stock price need to be considered in relationship your "time horizon" — the amount of time you are willing to hold the investment.

Short Term Horizon

Perhaps surprisingly, options are a very poor vehicle for day trading. By definition, a day traders position is held for less than a day, and so they need to profit on quick movements of their purchases. If you are a day trader (I am not), avoid options like the plague. While the leverage you can get may be appealing, the chances of an option moving in your favor in one day are slim.

If this doesn't dissuade you, then you need to select a near-term, in-the-money option with the highest possible delta — 0.90 or higher. An out-of-the-money option will never respond quickly enough for you to profit in this scenario.

If your view is slightly longer term, say a week or two, it may be worthwhile experimenting with options. When your time horizon is at least a week or longer, holding the option will soften the blow of a downside surprise. I've done this once or twice when I was also expecting a strong catalyst to materialize which would move the stock and had good results. Once again, you should focus your attention on near-term, in-the-money options, with a delta of at least 0.80.

Intermediate Term Horizon

Moving your time horizon out to a couple of months or more means that you might be able to take advantage of a somewhat larger movement in the stock. In this case, using an option with a lower delta will limit your risk, and an at-the-money option would be appropriate. Out-of-the-money options, which would have even lower deltas, should still be avoided in this case.

Long-term and Very Long-Term Horizon

Even lower deltas will be used in this case. This is the closest analogue to stock purchasing, and the success of this strategy will depend more on the fundamentals of the company and less on near-term catalysts. LEAP calls, which have expiration dates a year or two away, should definitely be considered[3] Even when using LEAPS, I generally favor in-the-money calls, and usually the deeper-the-better, since I prefer purchasing minimal amounts of time-value. In some cases, an at-the-money option or even a *slightly* out-of-the-money call may be purchased with a reasonable chance of success.

Paying a lot for a very out-of-the-money LEAP is a classic way to lose money on options. Even if the stock moves as predicted, due to the money you spent on the time-value of the option, it can be an up-hill battle to profitability. I learned this lesson the hard way when I first began experimenting with options. Take a tip from the jockey, and avoid getting yourself into this situation.

3.5 Up to the Minute Summary

- Buying calls is an apparently simple strategy, with large potential returns due to leverage. The dollar losses tend to be small.

- You can buy calls to "lock in" the price of a stock you want to buy.

[3]LEAPS are very similar to the shorter term options, but have some differences. LEAPS are covered in chapter 13.

- When buying calls, you must be right on both the stock and the time frame. It is not a very forgiving strategy.
- You can buy the wrong call on the right stock.
- Volatility can help improve the price of your calls.
- Out-of-the-money calls have greater risk and also greater potential profit.
- An in-the-money call has lower risk and lower profit.
- There is more chance of actually realizing a profit with an in-the-money call than with an out-of-the-money call.
- As always with options, buy as little time value as possible.
- The delta of an option is the amount the premium will advance for a corresponding change in the stock.
- The delta can be useful to a call buyer who wants to profit from a short-term movement by the underlying stock.
- The time horizon of your investment is how long you intend to hold it.
- The time horizon places constraints on both the delta and the relationship of the stock price to the strike price of the option you should buy.
- The general rule is that the shorter your time horizon, the higher the delta should be. It is safer to buy in-the-money options in all cases, but it is more important to buy in-the-money options when your time horizon is short.
- Long term positions can be established with LEAP call options. These expire in a year or two. With these options, a lower delta and perhaps a slightly out-of-the-money option can be tried.

3.6 You Bought the Call, Now What?

Tactics exist that can reduce your losses, or enhance your profits, depending on which way the stock moves. Note that some of these involve converting your call purchase to a spread, which requires trading in a margin account and sufficient option permissions. Do not enter a long call position and assume that you can use all of these tactics without checking with your broker first.

3.7 Actions to Take On a Price Decline

The easiest thing to do when the underlying stock drops is to cut and run. Particularly if your time-horizon is short, this may be the best thing to do. Profiting on short-term movements of stock is always fraught with peril, and if the stock has entered a decline, you should seriously consider taking your current loss before it gets worse. Depending on how long you have before expiration, there are other things you can try.

3.7.1 Averaging Down

Here's a situation many call buyers find themselves in:

EXAMPLE

You bought a July at-the-money $25 call in January for 3-points, hoping to win if the stock moved up quickly. If your call moves to $28, you will be at break-even — everything after that is "pure profit". One month later, the underlying stock has dropped to $22 and the call is now 1.5-points. You now have a loss in the position.

A typical response to this situation is to **average down** by buying more $25 calls at 1.5-points. The new calls have a break-even point of $26.50. Just to reach the new break-even point, the stock must make over a 20% move. This is probably not very likely. Even if it happens, have you really improved your position? Not by much, if any. You would have been better off to just close the position and accept the $150 loss.

3.7.2 Convert to a Bull Call Spread

An approach with better chances of success is to convert the call to a **bull spread**. Bull spreads are covered in more detail in chapter 4. But since this is a useful tactic when you are looking at a loss with a long call, I'll deal with it briefly here. The name of this spread comes from its more common use when you are optimistic about a stock. It has other uses, as you will see:

EXAMPLE

As before, you bought a July at-the-money $25 call in January for 3-points, with the shares falling one month later to $22, and the call falling to 1.5-points. In order to break-even, you need the stock to move to $28 by expiration. This is a 27% change in the stock, which seems improbable. You find a July $20 call which is selling for 3-points. You take the following steps:

1. Buy one July $20 call for 3-points.

2. Sell your original $25 call for 1.5-points.

3. Sell a new $25 call for 1.5-points.

Note that this transaction was done for even money, before commissions. For optimal results, *you must be able to do this for nearly zero additional costs.*

You are now long one July $20 call, and short one July $25 call. Since you got it for zero additional costs (excluding commissions), you haven't spent any more money. Think of it as a brand new position, which cost whatever you spent to buy the original long call ($300, in this example). This is not a naked call, since the short call is "covered" by a long call with a lower strike price.

This new position has a dramatically lower break-even point. If the stock advances by only $1, to $23 by expiration (a move of 4.5%), the July $20 call would be worth $3 while the July $25 would expire worthless. Should this occur, you can then sell the July $20 call for $300, recovering your initial costs. This 4.5% movement is much more probable than the 27% required for the same result with the original position.

The point where you will have a total loss of capital has also been lowered. The original position, with the $25 long call, loses everything below $25. With the spread, you lose everything if the stock drops below $20. As long as the July $20 remains above $20 by expiration, you can get at least some money back by selling the call.

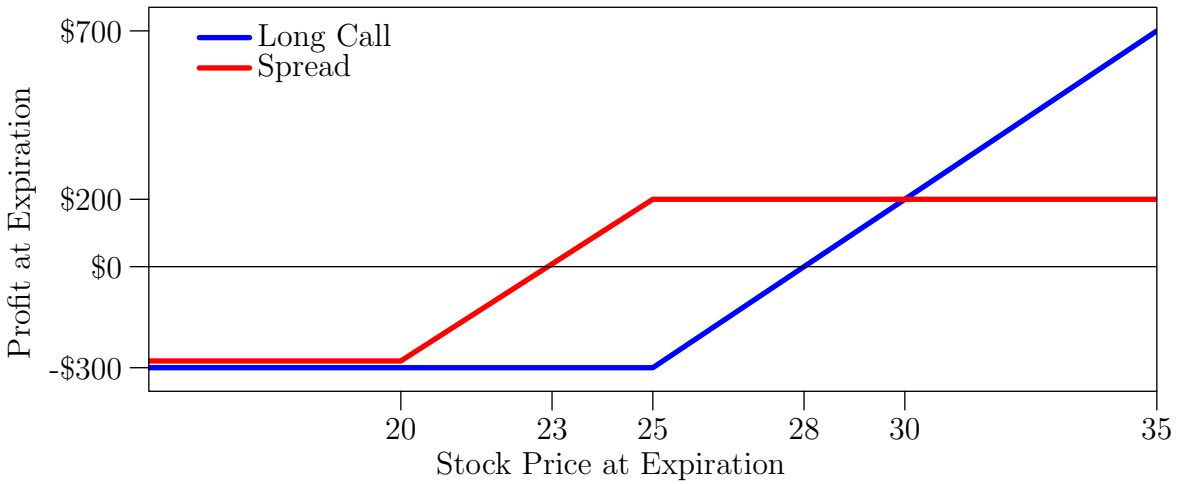

Figure 3.2: Comparison of original call purchase with spread.

If you take a look at Figure 3.2, which compares the profit graphs for both positions, you can see clearly what you have given up for the increased downside protection. While the original position had unlimited profit potential, as shown by the blue line heading off into infinity, the most you can make from the new position is $200 less commissions. To

understand why, consider what happens if your stock rallied to $26 by expiration. At that time, the $20 call would be worth 6-points, which you can sell for $600, leaving you with a $300 profit after you subtract your initial costs of $300. But the $25 short call would now be in-the-money, and sell for 1-point. You would have to buy this back, which reduces your profits to $200. This will be true for any price over $25 — for every point you gain in the long call you lose a dollar in the short call.

Both positions return the same profits at a stock price of $30, where the lines cross. Everywhere below that, the spread does the same or better than the original position.

You will not always be able to turn your your long call into a spread for even money — sometimes a debit will be incurred. When you are already in a losing position, it can be difficult to spend more money on it. The fact that your hopes of a quick profit have been dashed doesn't help. Hold your emotions at bay as much as possible, and evaluate the position rationally. The new position may give you better chances than the original. If so, you will be better off spending the extra money.

3.7.3 Converting to a Calendar Spread

Shorter term options may exist with the same strike price as your long call. If this is the case, you can try selling one of these, hoping that it will expire worthless. This would allow you to capture the premium and offset your losses on the long call. A position like this — a long and a short option with the same strike, but different expiration dates, it is known as a **calendar spread**.

Example

As before, you have a July $25 call you bought for 3-points now selling for 1.5-points, with the stock selling for $22. You find a March $25 call for 1-point. By selling the March $25 call, you can reduce your loss from 1.5-points to 1/2-point. Since you still own the long call, if the stock recovers after the expiration of your short call, you may be able to exit the position with no loss, or perhaps even a profit.

This strategy has dangers. Its success depends on the short-term call expiring worthless before the stock recovers. Trying to "time" short-term moves is either difficult or impossible, and in this case, can result in you having two losing positions instead of one. To see this, consider the situation you would be in if the stock increases to $27 by March expiration:

	Option Premium	Gain (loss)
March $25 Call	2	(1)
July $25 Call	2.5	(0.5)

To avoid exercise, you must now buy back your March call at a loss of 1-point. You still have a losing position in the July call. In fact, your position is the same as before, except

that you have spent additional money on commissions. This can not happen with the bull call spread. Converting to a spread or closing your position is probably better than the calendar spread.

3.8 Up to the Minute Summary

- Cutting your losses is often the best course of action when you have a loss on a long call. This is particularly true if your time horizon is short.
- Averaging down means buying additional calls for a lower price. This is generally not advisable.
- You can convert to a bull spread. If you have time left in your calls, this may be the best option.
- To convert a long call to a bull spread:
  1. Buy a call with the same expiration date but a lower strike price.
  2. Sell your original call.
  3. Then sell another call with the same expiration and strike price as your original long call.
  4. You should spend as little as possible for this new spread. Ideally, your costs should be zero.
- The new spread will typically give you much lowered break-even and maximum loss points.
- You have the possibility of profits, but they are now capped by the spread.
- Even if you have to spend extra money to enter the spread, it may be worth it. Evaluate the situation as rationally as possible.
- If you have time left until expiration, another possibility is to convert your long call to a calendar spread.
- To enter the calendar spread, sell a shorter term call with the same strike as your original call. The premium from this will help reduce your loss from the original call.
- The calendar spread has problems: If the stock should rally suddenly, you may be faced with a loss on both options.
- The best tactics to use when you have a loss in a long call position are either closing early to accept a smaller loss, or using the spread.

3.9 Actions to Take on a Price Increase

It is not uncommon to find yourself with a long call on a volatile underlying stock which has just made a substantial and quick move upwards. In spite of this, your call premium has not changed by much. The reasons for this are complicated and relate to delta, time decay and volatility. This is a frustrating situation to be in, and there's not much to do except wait or accept a much smaller profit.

But when you find yourself in the happier situation of a premium increase, be willing to take your profits. Don't be shy about taking them early, especially if your goal has been met. The shorter your time-horizon, the happier you should be when you get a quick profit on your long calls.

If you have bought more than one call, taking partial profits can be a smart thing to do. There is some dispute about taking partial profits when you are a shareholder, but options are a wasting asset. So when given the chance to reduce or even earn back your entire option investment and still leave room for profits, it is probably wise to do so. For example, if you sold 6 calls for $2 each (for a total $12), and they have now appreciated to $5, you should consider selling two, three, or even four calls, leaving the rest to "let your profits run".

Unless you bought the bought the long call to own shares, or you can use the call to reduce your cost basis on shares you already own by selling those shares and exercising your call, it is rarely in your interest to exercise the call, due to commission costs. You are usually better off selling the call. On the other hand, if the stock has not appreciated as you expect, but your long-term view of the possibilities for the shares is positive, exercising the call will give you the shares below market, and may be a good long-term plan.

Other possibilities are rolling the call up, or creating a bull spread.

3.9.1 Rolling Up

This can be a very profitable strategy when it works out.

Example

Shares of McKinnon's Instant Haggis, which trade under the ticker PUKE, are selling for $28. You buy a July $30 call for 3-points. The stock quickly rises to $38. Here is the situation at present:

PUKE	$38
July $30 Call (purchased at 3-points)	9-points
July $40 Call (available for purchase)	3-points

You have a profit in the July $30 of 6-points. There are also July $40 calls which sell for 3-points each. You decide to sell your July $30 call, and use your profits to buy two July $40 calls.

This strategy can result in dramatically increased profits when the stock continues to go up. The great appeal of this strategy is that it lets you "play with other people's money". Since you've recovered the full cost of your initial investment, everything you make after this is "free money". However, should the stock get stuck at $40, you would have been better off keeping the profits or trying something else.

3.9.2 Bull Spread

The bull call spread can also be used to improve a winning position.

Example

As before, you buy a July $30 call on PUKE for 3-points, and the shares move quickly to $38:

PUKE	$38
July $30 Call (purchased at 3-points)	9-points
July $40 Call (available for purchase)	3-points

Neglecting commission costs, you can sell one July $40 call and recover your initial investment. This creates a bull call spread, which you hold at basically zero risk — even if the entire position expires worthless, the most you can lose are your commission costs.

Here's a table that shows the profits from the new position at expiration:

Stock	Long July $30	Short July $40	Total Profits
20	0	0	0
30	0	0	0
32	2	0	200
35	5	0	500
40	10	0	1,000
45	15	(5)	1,000

As you can see, you win if the stock closes anywhere above $30 by expiration. The maximum profit is 10-points, because if the stock moves above $40, you will need to buy back the short call. As discussed in subsection 3.7.2, above $40, the losses in the short call will offset additional gains in the long call.

3.10 Which Strategy is Best?

There is no perfect answer to the question of which strategy performs best. The graph in Figure 3.3 compares the various possibilities. The shaded regions above the lines show the

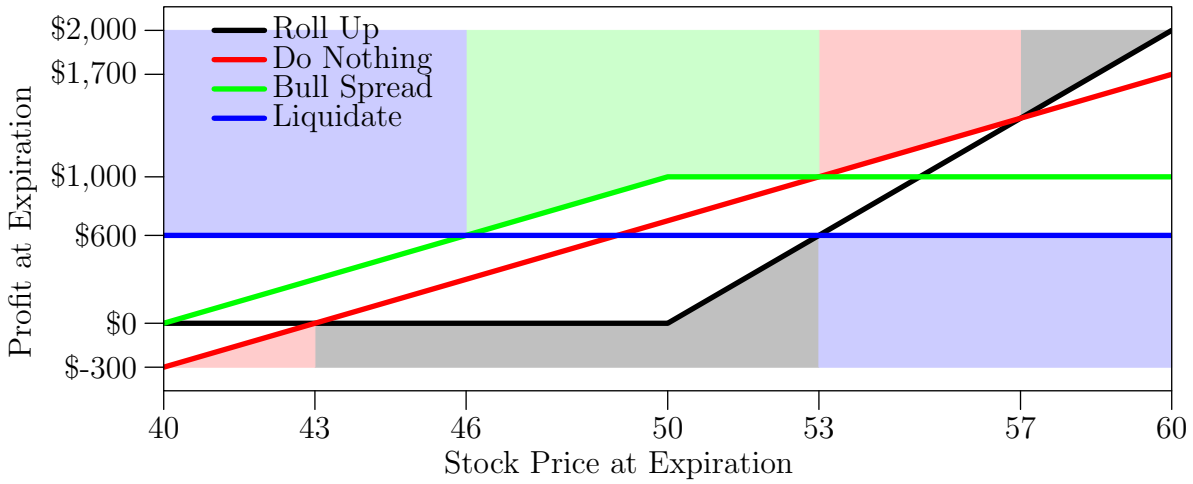

Figure 3.3: Comparing the returns from the various strategies.

best performers for that particular range of stock prices, while the shaded regions below the lines show the worst ones. The regions are drawn in a lighter shade of the same color as the strategy line.

I think the graph makes it pretty clear that the only possible answer is "It depends". It is worth noticing that while the bull spread is not always the best performer, it is never the worst. And while rolling up or doing nothing at all can provide higher profits *if the stock continues to appreciate*, the spread gives the best returns if the stock remains basically unchanged after its initial ascent. If you can sell a call for little to no risk, the bull spread has a lot to recommend it.

Rolling up produces the best profits when the stock continues to rise energetically, but it is the worst performer over a very large range. It doesn't actually move into the champions ring until the stock has reached $57. Unless you feel very certain that the stock is destined for greatness, the other alternatives provide better chances.

Liquidating outperforms all other choices if the stock falls back down. Clearly this is the best path if you are concerned about the stock holding on to its gains.

Doing nothing provides the best returns if the stock goes up significantly, but not dramatically. Since it is the only one which produces a loss, it is also the riskiest choice of the four.

3.10.1 Using a PUT to lock-in profits

Another possibility when you have a profitable long call position is to buy a put, creating what is known as a **strangle**. It is not possible to do this strategy justice here, since we haven't covered puts yet. It is discussed in section 10.1.

3.10.2 I Bought a LEAP Call. What About Me?

Calls with very long expiration times (a year or more away), are called **LEAPS**[4]. The long lifetime of LEAPS introduces some additional considerations which are covered more fully in chapter 13, but for the most part they differ little from the short-term calls we have been discussing. With a LEAP, it can be very profitable to do a diagonal bull call spread, where you repeatedly sell short-term calls against the longer term LEAP. This is very similar to the covered call strategy discussed in chapter 2, but using a long LEAP call to substitute for the stock position. Given the proper choice of underlying stock, LEAP and short calls, it is possible to make back most or all of what you spent on the LEAP call option, and still profit from premium growth in the LEAP.

If you are interested in further details on this very fine strategy, I refer you to the more extended discussion in subsection 13.9.1.

3.11 Up To The Minute Summary

- A volatile stocks price can go up substantially and not move the call premium by much.
- Taking partial profits is a good way to reduce your risk and improve your profits.
- It is rarely in your best interest to exercise the call, unless you are interested in owning shares.
- Rolling up can be very profitable. To roll a call, first sell your current call, and deduct your premium payment. Then buy as many of the higher strike calls that you can afford with whatever profits are left.
- A bull spread is also a possibility. It is never the worst choice when your calls are going up. It is usually possible to enter the bull spread for little or no additional cost.
- It is impossible to say which strategy performs the best. They all have their own strengths and weaknesses.
- LEAP calls are similar to the more familiar calls. You can create a calendar diagonal on a leap call to earn back the money you spent on it.

3.12 Chapter Glossary

Bull Call Spread Having a long call and a short call position on the same underlying stock at the same time. The short call should have a higher strike price. Usually both have the same expiration date.

[4]There are also put LEAPS.

Diagonalized Bull Call Spread A bull call spread where the short call expires before the long call.

Delta The rate of change of the option premium, with respect to the stock price. For example, if the option has a delta of 1/2, for every point of increase in the stock, the option premium will increase by 1/2-point.

LEAPS Options with an expiration date a year or more away.

Spreads A position with both a long and a short option held on the same underlying stock, at the same time.

4 The Bull Call Spread

This chapter assumes you are familiar with the basic concepts of options, as discussed in chapter 1. You may also wish to review the discussions of the delta in subsection 3.4.1.

4.1 Introduction to Spreads

A few new terms and a couple of new concepts will be introduced. Don't worry if you don't get them all at once. Once you see a few examples, you'll be fine.

Spreads are flexible creations and no simple definition can do them justice. In the simplest form of a **spread**, you have both a long and a short position on the same stock at the same time. You usually have an equal number of short and long options. The long and short positions are called the "legs", "arms" or "sides" of the spread. It's common to hear references such as "the long side" or "the long arm" used to refer to all the long options in the spread. The options can have different strikes, different expiration dates or both. They do not need to be the same type of option — you can mix calls and puts.

4.1.1 Classifications of Spreads

When you enter a spread, you get money from the short option you sell, and spend money on the long option you buy. When the option you sell pays you more than you need to buy the long option, it is called a **credit spread**. The opposite situation, where the short arm doesn't pay quite enough to subsidize the long arm, is a **debit spread**. Most brokers make it possible to buy both arms in one order, by specifying a net debit or net credit. If your broker has this feature, take advantage of it, since it saves on commissions and can result in better prices.

Spreads are also classified as **vertical** and **horizontal**. In a **vertical spread** both options have the same expiration date, but different strike prices. **Horizontal spreads** use options with the same strike price, but different expiration dates. There are also **diagonal spreads**, which have both different strike prices and different expiration dates. I found these terms impossible to remember, because they seemed so meaningless. But recently, I was told by an old-timer[1] that these terms terms date from the misty dawn of options. That was so long ago that investors actually used something called a "newspaper" to look up option premiums in listings that looked like the one in Table 4.1. As you can see, the option premiums are arranged vertically by expiration date, and horizontally by strike price. Since calls with the same expiration date but different strikes will always be

[1] Hi Nate.

	Calls			Puts		
Strike Price	May	Jun	Sep	May	Jun	Sep
50	6.20	6.70	8.00	0.10	0.25	1.05
55	1.60	2.05	3.30	0.80	1.50	1.60
60	0.10	0.30	1.25	4.20	4.80	5.20
65	0.05	0.05	0.40	7.10	8.10	8.80

Table 4.1: Example of a typical daily options listing from a newspaper.

in the same column, this came to be called a "vertical spread". Horizontal spreads will have the same strike, but different expiration dates. Diagonals have both, and so will move at an angle across the rows and columns. And this, according to the old timers, is where the names come from. I don't know if it's true, but it certainly makes them easier to remember.

4.1.2 How Spreads Work — The Bull Call Spread.

The reason for taking any position in stocks or options is because you believe the market has mispriced them. If you find a stock which is selling for $20 that should be selling for $25, you can buy it at $20 and sell it when it reaches $25. Of course, if the stock is mispriced, then the $20 call must also be mispriced. If the $20 call is selling for 3-points, you can buy it and then, when the stock reaches $25, sell it near expiration for 5-points, making a 2-point profit.

Let's assume for the moment that you are right about the stock — in fact, you are are so amazingly correct about the stock's value that the price will never go above $25. This means that the $25 calls on this stock are mispriced — they are too high. If the $25 call is selling for 1-point, you can sell it. At expiration, when the stock has reached $25, it will expire worthless. You have just made 1-point of profit.

The idea behind the bull call spread is simple: why not do both? You can buy the $20 call for 3-points, and also sell the $25 call for 1-point. At expiration, when the stock reaches $25, you would have a net gain of 3-points. This is illustrated in the much simplified diagram of what happens to the two call's premiums between the opening of the position and expiration shown in Figure 4.1.

The first thing to notice is that as the stock price increases towards expiration, the profit from the long call will go up and at the same time, the cost of repurchasing the short call goes down (recall that you are paid right away when you sell a short call). This is shown in the figure by the lines moving farther apart, or **widening**. A **widening** spread is a profitable one — may all your spreads widen.

But what happens to the spread if the stock price continues past $25? Perhaps surprisingly, you make the same amount. As illustrated in Figure 4.2, as the stock goes up, the long call increases in price. But once the stock reaches the strike price of the short call ($25, in this example), the short call's price increases dollar-for-dollar with the long call.

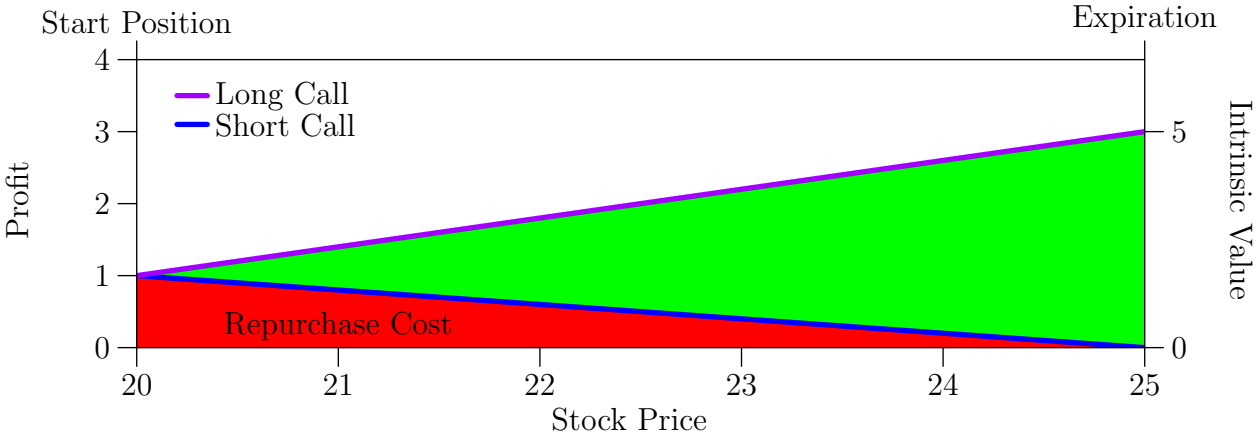

Figure 4.1: A widening bull call spread.

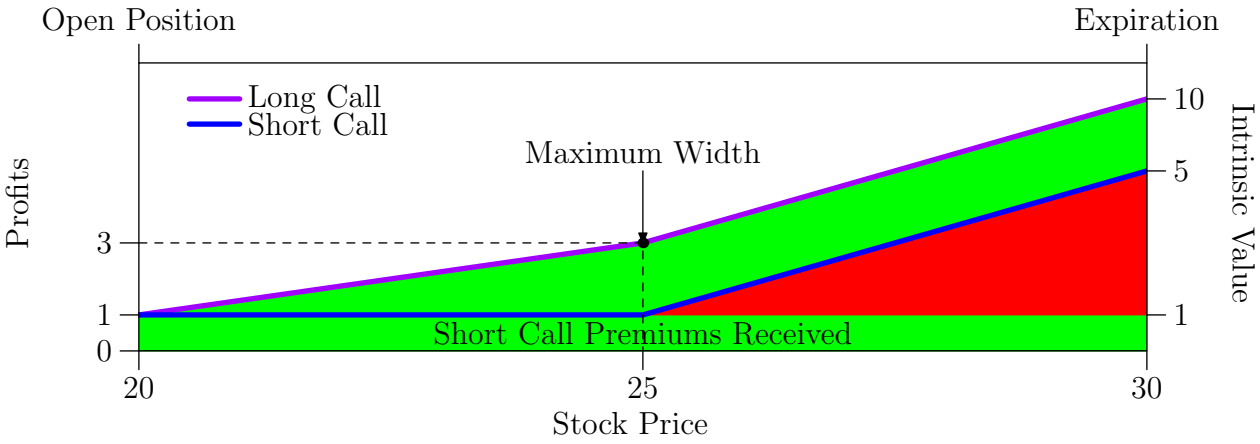

Figure 4.2: A widening bull call spread with large stock movement.

The red triangle in this diagram represents the amount you must pay to buy back the short call, which offsets the additional gains from the long call.

As we all know, it is not all roses and cottage cheese in the investing world. If the stock price should fall, the spread will **narrow** as shown in Figure 4.3. If held to expiration, both calls will expire worthless and you will lose some money. Your loss will be limited to your initial investment. May your spreads never narrow.

4.1.3 Why Use a Spread?

The advantage to a spread is that your risk is reduced. Your net investment costs in the long arm of the spread are offset by the premium received from the sale of the short arm when you open the position. You can think of a bull call spread as a hedged long call. This makes the bull call spread ideally suited for situations where you are mildly bullish

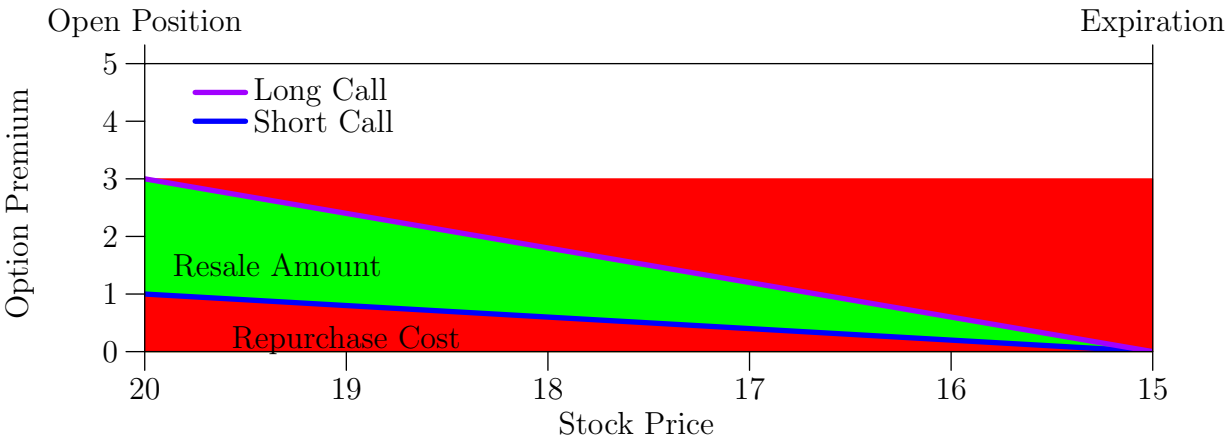

Figure 4.3: A narrowing spread held to expiration.

on the stock, and don't expect it to make an extreme movement to either side.

4.2 Characteristics of the Bull Call Spread

As I've said, to set up a bull call spread, you buy a long call and sell a short call with a higher strike price but the same expiration date. This makes it a vertical, debit spread. It's a vertical spread because the expiration dates are the same. And it's a debit spread, because the short call, being farther out-of-the-money than the long call, will always pay less than the long call will cost.

Example

You are mildly bullish on McKinnon's Instant Haggis (PUKE), whose stock is currently selling for $22. There is a March $20 call which sells for 3-points, and a March $25 call which sells for 1-point. You open a bull call spread with the following transactions:

Buy One March $20 Call	(3)
Sell One March $25 Call	1
Net Debit	(2)

Here's how the spread looks at expiration, for a variety of different share prices:

Stock Price	March $20 Profit	March $25 Profit	Total Profit
15	($300)	$100	($200)
20	(300)	100	(200)
25	(100)	100	0
30	200	100	300
35	700	(400)	300

The profit graph of the bull call spread is shown in Figure 4.4. All bull spreads have profit graphs with this shape. Notice that the maximum profit you can receive occurs if the

stock is anywhere above the higher strike price at expiration. There is also a break-even point, which will always be between the two strike prices. The maximum loss is equal to the amount of your initial investment, and occurs when the stock closes anywhere below the lower strike price.

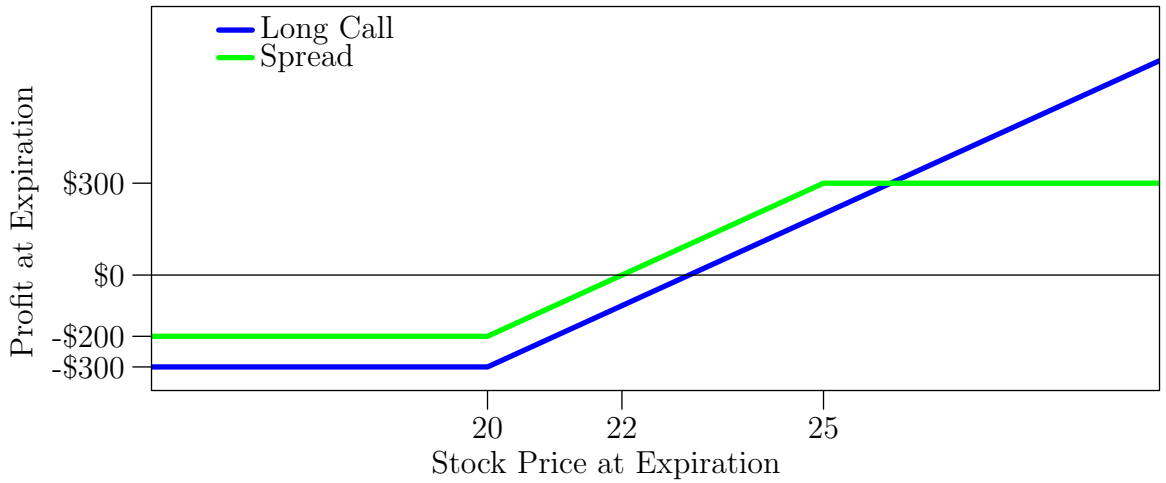

Figure 4.4: Profit graph of bull call spread (green). Also shows the profit graph of a long call, for comparison purposes.

These points are easy to calculate. Since it is always wise to include commissions, we calculate these first:

Commissions Per Share = Total Commissions/(Total Number of Contracts * 100)

Then the initial investment (same as the net debit):

Initial Investment = Long Call Premium - Short Call Premium + Commissions per Share

Then our points of interest:

Break-even = Lower Strike + Initial Investment

Maximum Profit = Higher Strike - Lower Strike - Initial Investment

For the example given (excluding commissions):

Net Investment = 3 - 1 = 2.

Break-even = \$20 + \$2 = \$22

Maximum Profit = 25 - 20 - 2 = 3.

4.2.1 Comparison of Spread vs. Call Purchase

Figure 4.4 compares the potential profits of the spread to the potential profits of just owning a long call. Note that the spread does better when the stock is anywhere below a stock price of $26, where the lines intersect. Above $26, given the long calls potential for unlimted profits, the long call does better. This should reinforce the earlier comments that bull call spreads should be used only when you are mildly bullish on the stock. If you are wildly bullish, you would be better off either buying calls or buying shares.

This is consistent with viewing the bull call as a *hedged long call*. You're mildly bullish, but have concerns about the downside. So you are willing to give up some potential profits to reduce your risk.

4.3 Selecting Strike Prices for the Spread

Selecting the proper strike prices is key to the success of the bull call spread. By placing the lower strike well out-of-the-money, impressive profits can result — on paper. This is a popular example in many books on options and also with brokerages that specialize in options trading, because it makes it look as though you can turn pennies into thousands. The well out-of-the-money spread costs almost nothing to establish, and if the stock cooperates, the profits are truly astonishing. The reality is that you are more likely to lose money in this position, since the underlying stock generally has a very remote chance of advancing far enough to turn your imaginary profits into reality. If you want to try this, use only a very small amount of your investible cash.

If you are interested in substantial returns, a more reasonable choice is to set the lower strike price relatively close to the current price of the shares. It can be either slightly in or slightly out-of-the-money. The higher strike should be set above this, in line with your expectations for the stock. Remember that the maximum amount the spread will pay is the difference between the strikes, but the stock must actually make it to the higher strike for this to happen. This is your low-cost spread, with good protection and substantial profits after commissions, when it works.

It is also possible to enter a spread where both calls are in the money. This has a much smaller maximum profit than the other possibilities, but you are much more likely to receive it. It gives the greatest amount of downside protection. It will be considerably more expensive to set-up, so the returns (including commissions) should be evaluated carefully. It's fairly rare to find this version in action.

4.4 Timing Considerations

Spreads are not a spectator sport. Watching water evaporate is more exciting than watching a spread widen. Spreads do best when the stock marches up as it moves slowly towards

expiration. If you are looking for quick profits or an adrenaline charged investing experience, do not use a spread.

Should the stock skyrocket shortly after you establish a spread, you will most likely be disappointed with how the spread responds. You may wonder if it even has a pulse. If a skyrocketing stock is a definite possibility, try setting the two strikes farther apart when you enter the spread. This gives more "room" for the spread to widen, although even so it won't reach its maximum profit immediately.

When placed in this situation, many investors try to figure out some method that will lock in their gains in case the stock drops back down, but still be able to hold on to the spread so they can get their maximum profit when it widens. Some truly bizarre constructions have been tried. The truth is there is no hedge that can accomplish both of these objectives. You can lock in the profits from a bull call spread in this situation, but you need to enter another spread, called a bear put spread, in order to do this. Bear put spreads are discussed in chapter 12.

I like a lot of time for my bull call spreads to mature, and I have used LEAPS of a year or more with very good success. If you pick the stock properly, it is quite possible to double your money or better on a small stock movement given that time frame.

4.5 A Few Comments on Selecting Bull Call Spreads

Using potential returns to sort a list of possible bull call spreads into potential investment candidates will place the most deeply out-of-the-money spreads at the top of the list. Since these are the most likely to *lose* you money, this is not a very good approach. It is best to rely on a good understanding of the underlying stocks fundamentals and economics. This becomes more important as the time-frame of your investment increases.

The volatility of the stock, especially for shorter term spreads, should be a consideration. Unfortunately, the mathematics for evaluating volatility are complex, and will not be given here. But recalling that volatility increases the time-value premium of an option suggests a possible approximation. A reasonable assumption to make is that the most a stock can move (in either direction) is equal to *twice the time value premium of an at-the-money option on that stock*. Then you can cross any spread whose maximum profit depends on a stock price higher than this off of your list. This is not the most refined or accurate method, but it has the virtues of speed and simplicity. And it allows you to at least incorporate some estimate of volatility into your evaluation. Since long-term options have more time value premium than short-term options, this method will also compensate for larger movements during the longer time frame.

Example

You are considering a spread on Dottie's Dainties. The shares are currently at $32. The $30 call is selling for $6. There is no $32 call, so we will choose the $30 call as the best one to use for our volatility estimate. The time value of the $30 call is 4-points. This gives us

an upper-limit for the stock price of $38. From this, it seems that buying a $30 call and selling the $35 call is a reasonably good candidate for a spread, while any spread involving a $40 call is unlikely to be be profitable.

4.6 Miscellaneous Considerations

Traders are often tempted by bull call spreads when option premiums become inflated. They might prefer a long call position, but the calls cost a lot. Since the long leg of a bull call spread is partially paid for by the short leg, it will help with the cost. It would be a mistake to use this only because you have to pay a lot to own the calls — you may be giving up a lot of upside for the sake of saving a few dollars.

It is possible to diagonalize a bull call spread, by using a shorter time to expiration for the short arm of the call, and this may be a better approach than the vertical bull call spread. If this sounds interesting, please see chapter 4, as well as the further discussion in subsection 13.9.1, where a LEAP is used for the long-arm of the spread.

4.7 I've Established a Bull Call Spread, Now What?

Truthfully, there is not much to do after you've established the spread but twiddle your thumbs. If the underlying stock advances substantially, you will want to keep your eye on the time value premium in the short call. Should the short call start trading at or below parity, you will want to close the position to avoid assignment. The stock may fall, in which case you can consider closing the spread to limit your losses. You can close the spread in the same way as you opened it, entering it as one order, to save on commissions and potentially get better pricing.

When you close the spread in this way, you will need to tell the broker how much you wish to receive when you close it, which of course is determined by the difference of the option's premiums. This is specified as a "net credit" in your order. Should you be in the unhappy position of exiting the position at a loss, you will need to tell the broker how little you are willing to lose (entered as a net debit, or as a negative number in the "net credit" entry in the brokers form).

It is wise to be realistic. The maximum you can receive from the bull call spread is the difference between the two strikes. Due to the differences in the option marketplace between the bids and the asks, even if your spread is at its maximum width, obtaining the full amount is not a realistic expectation. If you are expecting a net credit of 5 points, you might be able to get 4.90, but may have to be happy with 4.75. Most brokers do not charge for canceling orders, so you can try for your maximum price initially, and then cancel and enter a new sell order if it doesn't seem to be working out. It is best to avoid closing the spread via exercise, since that involves extra commission costs.

If the stock drops, the short arm will drop in price. If you think the stock is likely to rebound, you can consider buying the short call back to lock-in your profits on that arm. This will leave you with a long call position. If you can buy the short call back for around $0.10, you give up almost nothing to do it. It's probably not a good idea to buy it back if it has much more value than that, unless you are closing the entire spread.

If you are near expiration, and the share price has not increased enough to make your spread profitable, your choices are limited. If the long arm of the spread is in-the-money, you can exercise to get shares. If you are bullish on the stock, this may be better than opening a new spread.

When the stock increases, the long arm will increase in price. Avoid with all your might the temptation to take profits by selling the long call while still keeping the short call. You may gain additional profits if the stock goes back down, but the risk in this position (which is a now a naked call) is huge. If you sell the long side, also get rid of the short side.

4.8 Other Uses for Bull Call Spreads

The bull call spread is the ginsu knife of options trading, with a thousand and one uses. Two of them were already mentioned in chapter 3, where it was used to both limit losses on the downside and enhance profits on the upside of a call purchase. But that's not all.

4.8.1 Using a Bull Call Spread to Repair Stock Losses

You purchased 100 shares of a stock at the price of $28, which is now selling for $22. You need the stock to gain 6-points to break even. There is an April $20 call which is selling for 4-points, and an April $25 call which sells for 2-points. You make the following transactions:

Buy one April $20 call	(4)
Sell two April $25 calls	4
Net debit:	0

It may seem as though this involves you in a naked call position, but it doesn't. One of the short April $25 calls is covered by the long April $20, and the other one is covered by your 100 shares of stock. In other words, you have one bull call spread, and one covered call position.

Consider what happens now if your stock advances to $25 by expiration. If this happens, your two short calls will expire worthless. The long $20 call will be worth $5, so you have $500 in option profits. Since the stock is still 3-points below where you bought it, you have a $300 loss in the stock. But your net profit from this position is actually $200: $500 in option profits, less the $300 loss in the stock This is illustrated in Figure 4.5.

Notice that both positions are equal at $30, where the lines intersect. So from the current price ($22), the stock would have to move 8 points in order to simply equal the

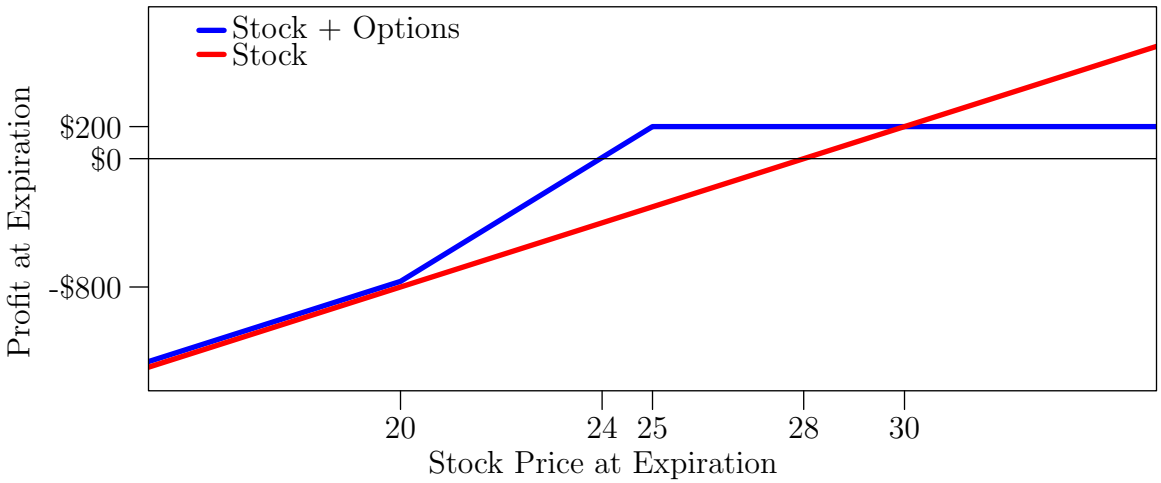

Figure 4.5: Stock repair with options.

new position. The break-even point has been lowered by 4 points, to $24. Should the stock continue to drop, the calls will expire worthless, and you can try again if you wish. This strategy has a tremendous amount to recommend it. You stand to gain a lot and give up very little if you are able to do something like this with a losing stock position.

When the option premiums cooperate, this can also make a good opening position. For example, if you were just opening a position in this stock, you could buy the shares and then buy one April $20 and sell two April $25's, at even money, just as you did here. The spread would outperform holding just the stock unless the shares went above $26 by expiration.

4.8.2 Using Bull Spreads Instead of Covered Calls

You can buy a deep in-the-money call with little time premium, and write a close-to-the-money call against it. This has similar characteristics to covered call selling (see chapter 2), with the long arm of the position acting in place of the stock. This is a type of bull spread, with the lower call well-in-the-money and the written call closer to it. You would not want to replace your covered call writing opportunities completely with this strategy, since a market decline would wipe you out. After all, in a covered call strategy, you still own the shares and can wait for them to recover. But a small amount of money might be moved into a position like this, which would cost less than the covered call positions, and the remainder placed in treasuries. It is a reasonable strategy for a cautious investor.

Example

Nate's Hula Dancers shares are selling for $89. There is a May $90 call which sells for 3-points, and a May $75 call which is selling for 14-points. Here are the two possibilities:

Covered Call	
Buy 100 Shares @ 89	($8,900)
Sell 1 May $90 call @ 3	300
Net Investment:	$8,600
Bull Spread	
Buy 1 May $75 call @ 14	($1,400)
Sell 1 May $90 call @ 3	(300)
Net Investment	$1,100

Here is a table comparing the returns from each position when the stock is over $90 in May:

	Covered Call	Bull Spread
Max profit	$400	$400
Break-even	86	86
Cost	$8,600	$1,100

As you can see, the potential returns and break-even are exactly the same for both positions. But the spreader risks much less capital, and can take the $7,500 saved and put it into a safer investment to earn interest, or find other stocks or options to invest in. Of course, if Nate's pays a dividend, that should be considered. Finding a deep-in-the-money call is key, because you want the premium of the long call to move in lock-step with the stock[2]. Of course, such a call may not be available but if it is, this is a viable strategy.

4.9 Up To The Minute Summary

- A spread involves having a long and a short position on the same underlying stock at the same time.
- The two positions are called the "arms", "legs", or "sides" of the spread.
- A spread becomes profitable when it widens, which is when the short arm becomes less valuable, and the long arm becomes more valuable.
- If the spread narrows, you will lose money.
- Spreads can be classified as debit spreads or credit spreads:
  - A **debit** spread costs you money to enter it.
  - A **credit** spread pays you to enter it.

[2]If you don't understand this comment, review subsection 3.4.1 on deltas.

- Spreads can also be classified as vertical, horizontal or diagonal:
  - In a **vertical spread**, both options have the same expiration date, but different strike prices.
  - In a **horizontal spread**, both options have the same strike price, but different expiration dates.
  - In a **diagonal spread**, the options have both different strikes and different expirations.
- You should be mildly bullish on the stock to consider a bull spread.
- To set-up a bull spread, buy a call and sell a call with a higher strike, but same expiration date.
- Spreads do best when the stock slowly advances to the upper strike by expiration.
- Little followup action is required in a bull spread.
- If the stock appreciates, pay attention to the short arm to prevent assignment.
- If the stock falls, you can close the position to limit your loss.
- If the stock falls, you can also sell the short arm to lock-in profits from that arm.
- You should never sell the long call without closing the position completely. Leaving yourself with a naked call is very high risk.
- You can use a bull call spread and a covered call to repair stock losses
- You can use bull spreads instead of covered calls if the right calls are available.

4.10 Chapter Glossary

Credit Spread A spread which pays you money when you open it.

Debit Spread A spread which costs you money to open.

Diagonal Spread A spread where the options differ in both the strike price and the expiration dates.

Horizontal Spread A spread where the options have the same strike price, but different expiration dates.

Vertical Spread A spread where the options have the same expiration date, but different strike prices.

5 Diagonal Bull Call Spread

This chapter assumes you are familiar with the basic concepts of options, as discussed in chapter 1. If you are unfamiliar with spreads, you may also wish to read section 4.1.

5.1 Diagonalizing a Spread

A **diagonal** spread uses different strike prices and different expiration dates for each leg of the spread. To avoid the danger of ending up with a naked call position, make sure the long-leg of the spread expires after the short-leg. Doing this will give the long-leg more time-value, so it will cost more than the short-leg but it will also retain some value on downward moves of the stock. This gives the diagonal spread a slightly bearish character.

Diagonalizing is a technique that can be applied to any spread, rather than a particular type of spread. One particularly nice feature of a diagonalized spread is that when the short side has expired, it is often possible to sell another short-term call and recover more of your initial investment.

5.1.1 The Diagonal Bull Call Spread

As in the vertical version of this spread, you buy a call, and also sell a call with a higher strike price. The long side of the spread will have the later expiration date. This gives you a downside hedge in case the stock does not advance sufficiently by expiration. Once the short call expires, another one can be sold, sometimes at a different strike price, to re-establish the spread and make more income.

Let's compare the diagonal spread with the vertical spread described in chapter 4. Arlo's Political Cartoons is selling for $22, and has the following calls to choose from:

	March	June	September
ARLO $20 Call	3	4.	5
ARLO $25 Call	1	1.5	2

We establish two spreads:

Vertical Bull Spread Buy March $20, sell March $25 for a debit of 2-points.

Diagonal Bull Spread Buy June $20, sell March $25 for a debit of 3-points.

The vertical spread has a maximum profit of 3-points if ARLO closes anywhere above $25 by the March expiration. The most you can lose is your initial investment of 2-points, which occurs if ARLO closes anywhere below $20 at the March expiration.

The diagonal spread has a maximum profit of 2-points at the March expiration if the stock closes anywhere above $25. Should the stock close below $20 at the March expiration, the June call should still have some time-value left and can be sold to reduce the loss, or held onto in case the stock recovers. How much the call will cost depends on a variety of factors, but here are some possibilities:

Stock Price @ March Expiration	10.	14.	17	20	22	25.	30	35
June. 20 Premium @ March Expiration	0.05	0.50	1	2	3	5.50	10	15

Figure 5.1 gives the profit graph for both the diagonal and vertical spreads. The line for the diagonal spread is curved, not straight, because there is still time value remaining in the long call.

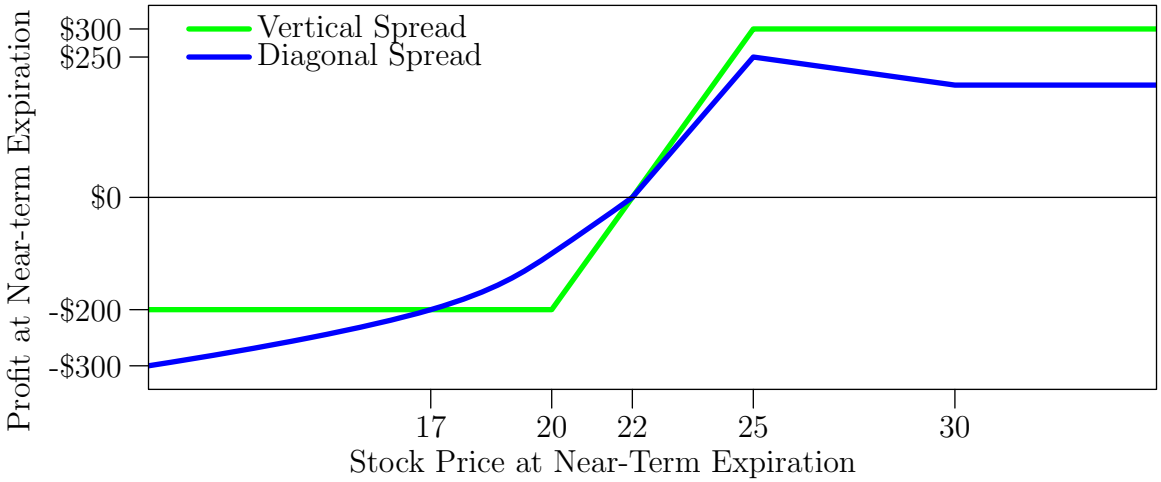

Figure 5.1: Profit graphs comparing the vertical spread with its diagonalized version.

Looking at the graph, you can see that if ARLO experiences a really terrible drop both spreads will be pretty much a total loss. The diagonal will be the big loser because it costs more to setup. On the other hand, the diagonal outperforms the vertical spread between $17 and $22, losing less at every stock price between these two points. There is also an interesting fine point about the diagonal spread that should be mentioned. Observe that at the strike of $25, when each spread should reach their maximum width of 5 points each, the diagonal spread actually widens to more than 5-points. This is because of the extra time value remaining in the long June call.

The graph makes it clear that the investor gives up a very small amount of upside for the advantage of hedging his downside.

Once the March call has expired, the spread can be closed by selling the long call. But it may be better to sell the June $25 call and create a new spread. The new spread will be a typical vertical bull call spread. If ARLO were still $22 at March expiration, then the June $25 call would probably sell for the same price that the March $25 call did, which

was 1-point. Selling this call reduces our initial debit to the same amount as the vertical spread (2-points), and gives more time for the stock to move in our favor. But ARLO may be higher in June, perhaps just below the $25 strike. If you think it is likely to run higher, sell the June $30 call.

If ARLO is below $20, it may be better to leave the call long. The $25 calls would probably have very depressed premiums if this were the case, and re-establishing the spread might not be worth it. Leaving the call long leaves open the possibility of re-establishing the spread when the share price recovers. If you think ARLO will continue to move down, then it is probably best to sell the call.

5.1.2 Using LEAP Calls in a Diagonal Bull Spread

This strategy can employed using a LEAP[1] call for the long arm of the spread. LEAPS are more expensive, but give the investor more opportunities to sell short calls against them, due to their longer lives. This can significantly reduce your net investment, and in some cases, completely pay for the LEAP.

If the LEAP is chosen well, and the stock appreciates significantly over the year or two you hold the position, you can end up with an excellent profit. At that time, you can sell the LEAP and take your profits, exercise to get shares, or roll the LEAP up to a higher strike price, and continue the strategy. This would depend on the economics and outlook of the business and how you think this will impact the share price.

Large, mature companies whose share price is depressed are excellent candidates for this strategy. While you will sacrifice any dividend the company pays, you can often earn more from the short term call premiums. If this strategy sounds appealing, subsection 13.9.1 has an extended discussion of this strategy.

As mentioned in subsection 13.9.1, using LEAPs makes a diagonal bull call spread resemble a covered call strategy with the long LEAP used to replace the stock. The same techniques discussed in chapter 2 for covered calls, such as rolling up, or rolling forward, can be used with this strategy.

5.2 Up to the Minute Summary

- A **diagonal** spread uses different strike prices and different expiration dates.

- The long-term call should be the long-arm of the spread. The expiration date of the long term call should be far enough away so that the short call is covered at all times. You do not want a naked call position at any time.

- Diagonalizing is a technique. Any spread can be diagonalized.

[1] LEAPS are options with an expiration date of a year or more away.

- Diagonalizing a spread gives it more downside protection and reduces the maximum profit.
- Once the short-arm of the diagonal spread has expired, you can sell a new short-term call, to reduce the cost of the spread or enhance profits.
- The diagonal bull call spread can be used with LEAP calls as the long arm of the spread. This makes the bull call spread appear more like a covered call position than a bull spread, with a long call used to replace the stock position.

6 Puts

Having spent a few chapters focusing on call options, we will now do the same for puts. Basic information on options can be found in chapter 1 — if you are new to options, you should read that before continuing.

Puts and calls have many similarities. Both have an underlying security, a strike price, an expiration date and a premium. A put's premium, like like the premium of a call, has an intrinsic value portion and a "time value" portion.

While a call gives the buyer the right to buy stock at the options strike price, a put gives the buyer the right to *sell* stock at the options strike price. And while the call buyer will exercise his right when the stock price is higher than the strike, it only makes sense for the put buyer to exercise his right when the stock price is lower than the strike price of the put.

Puts can be described as "upside down calls", and you'll find that many of the strategies that you can use with puts are mirror images of call strategies. However, the mirroring is not exact — there are differences.

6.1 Put Pricing

The same four factors that influence call prices also influence puts:

1. The relationship of the strike price to the share price of the underlying stock.
2. The time left until the option expires, and the volatility of the stock.
3. The dividend yield of the underlying stock.
4. The current risk-free rate.

Example

Shares of Laughingbrooke Industries are selling for $20. A $30 put on this stock would be worth at least 10-points, because the put gives its owner the right to sell 100 shares of Laughingbrooke Industries for $30 — 10-points above the market price.

A $10 put, with a strike 10-points below the current share price, will be worth very little and if the stock stays above $10, will eventually expire worthless.

Unlike a call, *a put becomes more valuable as the stock price drops.* A put is in-the-money when the stock price is below the strike price, and out-of-the-money when the stock price is higher than the strike price. As illustrated in Figure 6.1, the definitions of in-the-money and out-of-the-money for puts are "upside down" versions of the definitions for calls. However, both calls and puts become more valuable as they go deeper in-the-money, and less valuable when they move out-of-the-money.

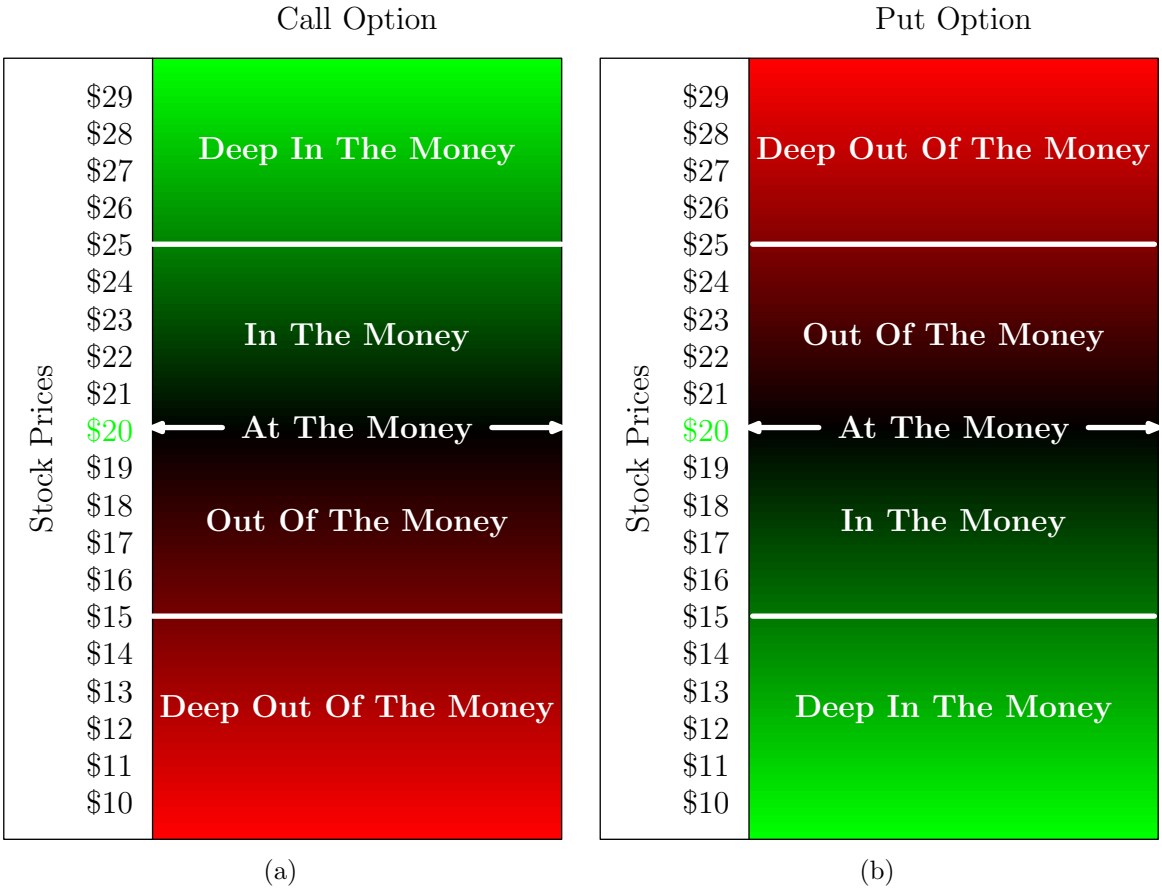

Figure 6.1: Relationship of stock price to (a) call with a $20 strike price; (b) Put with a $20 strike price.

Just like call premiums, put premiums have an intrinsic value component and a time value component. As with calls, the intrinsic value of a put is the difference between the stock price and the strike price:

Intrinsic Value = Strike Price of Put - Stock Price

The time value premium is the difference between the options premium and the intrinsic value:

Time Value = Put Premium - Intrinsic Value

A little algebra gives a single formula for the time value:

Time Value = Put Premium + Stock Price - Strike Price

Note that these formulas are slightly different from the formulas given for calls. Here are the call formulas for comparison:

Intrinsic Value of Call = Stock Price - Strike Price of Call

Time Value of Call = Call Premium + Strike Price - Stock Price

The formulas need to be different so the sign of the time value will be correct[1].

As with calls, when a put is out-of-the-money, its intrinsic value is zero. The entire premium of an out-of-the money option, whether a call or a put, is time value.

EXAMPLE

Laughingbrooke Industries shares are at $28, and a March $30 put is selling for 5-points.

Intrinsic Value = $30 - $28 = $2.

Time Value = $5 - $2 = $3, or using the alternate formula:

Time Value = $5 + $28 - $30 = $3

6.1.1 The Put Option Price Curve

Figure 6.2(a) shows the put option price curve, and Figure 6.2(b) shows the call option price curve. These are closer to an actual options price curve in the marketplace than the idealized one shown in Figure 1.3. The overall shape of both remains a gentle, concave curve.

The most obvious difference is that the intrinsic value lines are *mirror images* of each other. The intrinsic value of the put is zero until the stock falls far enough to reach the strike price, and then angles sharply upward, going up one point for every point the stock *decreases*. The calls intrinsic value remains zero until the stock reaches the strike price, and then angles sharply upwards.

The actual price curves are not exact mirrors of each other. The time value of both puts and calls will be greatest when they are at-the-money, but *the call option typically has a higher price at the strike than the put option does.* Also notice that *an in-the-money put loses time value faster than an in-the-money call.* Time value decay is non-linear for both types of options.

[1] Time value *can* be negative so it would not be correct to use the absolute value function.

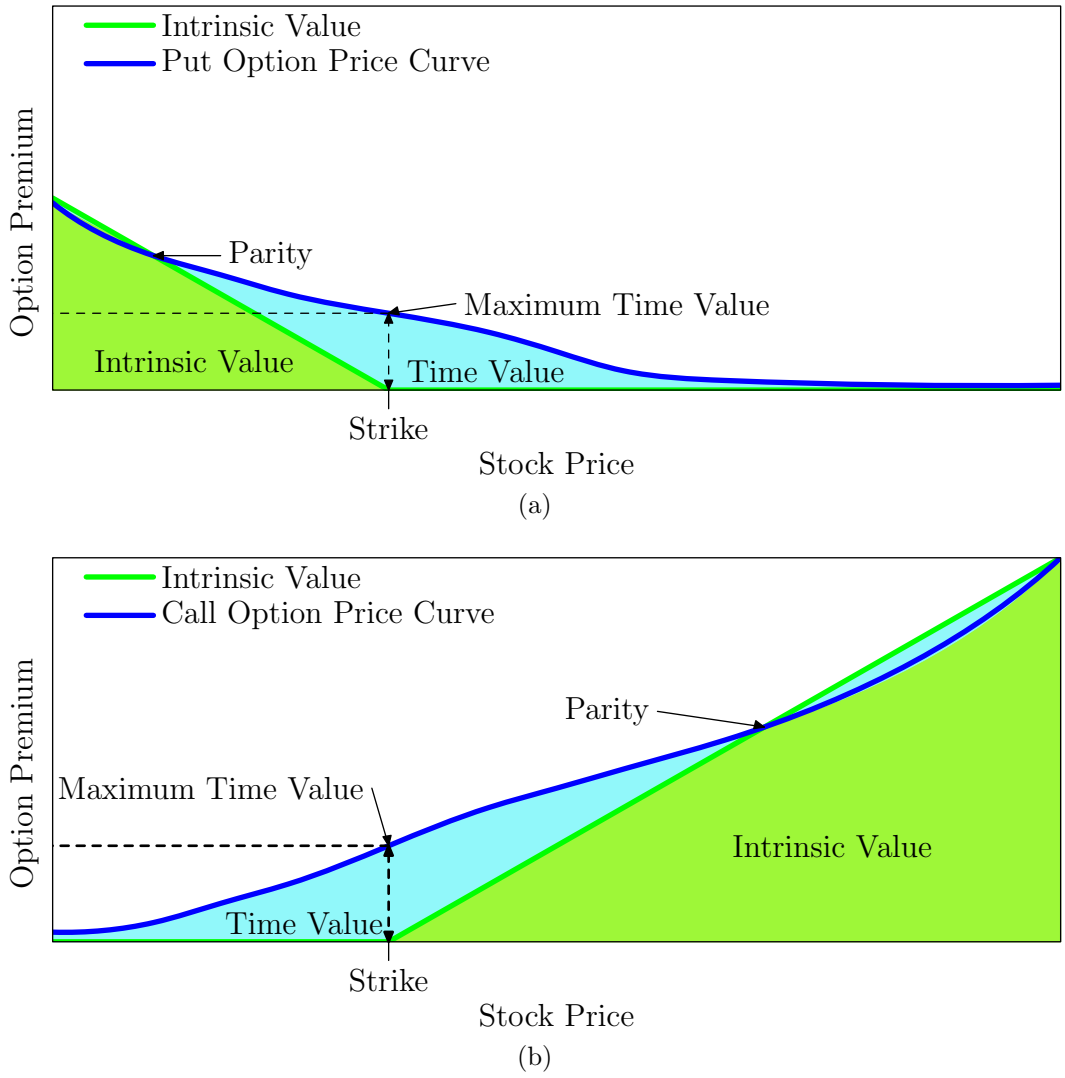

Figure 6.2: The Put Option Price Curve (a) and Call Option Price Curve (b) with their Intrinsic Value Lines.

6.1.2 Effects of Volatility and Interest Rates on Put Premiums.

Premiums of both calls and puts are increased when the volatility of the underlying stock increases. As mentioned in section 1.2, the precise effects of interest rates on option premiums is a subject of debate. It's generally agreed that a higher risk free rate tends to increase option premiums, but no one seems to agree on how much.

6.1.3 The Effect of Dividends on Put Premiums

A large dividend payment reduces the price of the stock. This has the expected effect on call and put premiums. Since the price of the shares is less, large dividends depress call premiums, but increase put premiums. This is a logical consequence of the way calls and puts respond to any change in the underlying stock's price.

6.2 Exercising the Put

If you are the owner of a put, and you decide to exercise it, you sell the stock to your counterparty at the striking price of the option. You may use stock that you currently hold, or you may purchase it on the market. If you do neither, the exercise of the put (which may done for you automatically on expiration day), creates a short position in the underlying stock in your brokerage account. This may cause a margin call if you do not have enough collateral.

If you are a put seller, you must buy the stock when the put is exercised. You can sell the stock immediately, or you may hold it. Should you already have a short position in this stock when you are assigned, the assignment may be used to cover your short.

6.2.1 Warning Signs of Early Exercise

In general, options are not exercised prior to expiration. When an option (either a call or a put) begins to trade near or below parity, it is at risk of early exercise. The option price curves (Figures 6.2(a) and6.2(b)) illustrate such points — note that when options trade below parity, their time value is negative.

The reason options trading below parity are vulnerable is because they create opportunities for arbitragers to make risk-free profits:

Example

McKinnon's Instant Haggis (PUKE) shares are selling for $20, and a $30 put is selling for 9.75-points, or 1/4th-point below parity. An arbitrager can make money with the following trades:

1. Buy the put at 9.75.
2. Buy 100 shares of PUKE at $20.
3. Exercise the put to force a sell of the PUKE shares at $30, making 1/4-point of profit.

A similar arbitrage exists for calls. Obviously, to make money at this trade, you must have extremely low commissions costs. It is typically done by exchange traders or floor traders whose commission costs are practically zero.

As a result of this type of arbitrage, when your put is in the money and the time value disappears, if you do not wish to be assigned shares, you need to take action.

Ex-dividend dates can also cause early exercise. If you have short calls, they may be exercised on the ex-dividend day of the underlying stock. This allows the call owner to capture the dividend from the stock. If you have short puts, the puts may be exercised the day *after* the ex-dividend date of the underlying. The reason for this is that in order

for a shareholder to receive dividends from stock ownership, they only need to own the shares on the ex-dividend day. Someone whose only interest is in capturing the dividend will obtain the shares, hold them for the day, and then exercise your short put to get rid of them.

Unlike call sellers, who only have to check to see if their short calls are trading at or below parity as the ex-dividend date approaches, the put seller must check the amount of time value premium left in the put and compare it to the amount of the dividend to be paid. *If the amount of time value left in the put as the ex-dividend approaches is greater than the amount of the dividend per share that will be paid, then the risk of assignment is much less.*

If you do not want to be assigned shares on the day after the ex-dividend date, it is best to take action before that.

6.3 Explanation of the Relationship Between Call and Put Premiums.

This section is included for the curious. You do not need the information in this section to invest with options.

The reason that a call with the same strike price and expiration date as a put will generally sell for a higher price is due to do the actions of arbitragers. When prices are favorable, arbitragers will buy 100 shares of stock, then buy a put and sell a call, both with the same strike and expiration date. This is an absolutely risk free position. Should the stock rise, the long position in the stock offsets the rising price of the call. Should the stock fall, the long put can be exercised. There are many arbitragers, and they must take large positions since the profit for each one of these is small. The action of these arbitragers cause the stock to rise (because so many of them are buying shares). The put price will go up for the same reason. Since the call is short, its price will drop because there are so many sellers.

Once this occurs, the position would no longer be profitable. In that case, arbitragers would perform the reverse trade: They short 100 shares of stock, sell a put and buy a call. This position has no risk and once again will cause a price adjustment in the market, lowering share prices, lowering put prices, and causing call prices to rise.

Without going into the details of the pricing, costs and returns of such arbitrage, this is the reason that puts tend to sell for less than calls when they both at the strike price. It is also the reason that puts lose time value premium faster than a call does when it is in the money.

6.4 Up to the Minute Summary

- Calls and puts have many similarities:
    1. Underlying security

2. Strike price
3. Expiration date
4. Premium, composed of intrinsic value and time value.

- Puts give the buyer the right to sell stock at the strike price of the option.
- The same factors that influence call premiums also influence put premiums, with these differences:
  1. Puts become more valuable as the stock price *drops*.
  2. Puts are generally less expensive when at-the-money than an at-the-money call option. This relationship is caused by the activities of arbitragers.
  3. In-the-money puts lose time value faster than in-the-money calls. This is also caused by the activities of arbitragers.
  4. Large dividend payments *increase* the price of a put option.
- Any option trading at or below parity is vulnerable to early exercise.
- A put may be exercised on the day after the ex-dividend date, especially if the amount of time value left in the put is less than the amount of dividend per share that will be paid.

6.5 Chapter Glossary

Margin Loosely defined, **margin** is the amount of money your broker is willing to loan you for the purchase of securities in your brokerage account. This is based on the total value of the account.

Margin Call When the amount of securities you purchase exceeds the amount of money your broker is willing to loan you, you will be asked to deposit cash or securities to make up the difference. This can also be caused by a down market, when the total value of your account decreases. It can also be caused by the exercise of one of your short puts.

7 Put Selling

Chapters 1, 2 and 6 cover the basic background required for this chapter.

7.1 Selling Naked Puts for Income

To engage in this strategy, you should be neutral to bullish on the underlying stock, since you will make money only if the underlying stays the same or rises in price. Unlike a naked call seller, whose risks are unlimited, the naked put sellers risk is the same as the owner of the stock — limited by the fact that share prices can't drop below zero.

As the seller of a put, you accept the obligation to buy the underlying stock at the strike price of the put. You are compensated by receiving the put premium. At expiration, if the underlying's price is above the strike, you won't be assigned shares and you keep the premium. However, the obligation to purchase shares if the stock price falls is a downside risk that must be considered when entering a naked put position.

Example

You find stock selling for $30 a share, and a 6-month $30 put on the stock selling for 4-points. If you sell the put, you can make $400 less commissions if the stock is at $30 or above at expiration. Should the stock drop, your potential losses are limited only by the fact that the stock can't drop below zero. Here is a table showing returns and losses for a variety of stock prices at expiration:

Stock Price	Gain (Loss)
10	($1,600)
20	(600)
26	0
30	400
40	400
50	400

Most brokers require new option accounts to have enough cash to completely cover the cost of assignment plus commissions before you are allowed to sell a naked put. This is called a **cash secured put**. You can count the premium received from the put towards this amount. For the $30 put in the above example:

Cost of shares (100 @ $30)	$3,000
Less Premiums Received	(400)
Plus Stock Commissions if assigned	10
Plus Option Commission	10
Net Security Required:	$2,620

Even if you have a margin account, you will probably be required to secure the puts with cash. If your broker allows you to use margin to secure the puts, the requirement is much less. In the present example, you would only need to have $1,400 in collateral, and it need not be cash.[1] Stocks or other securities can be used. But since most newcomers to options will need to secure puts with cash and not margin, we won't discuss margin requirements further.

7.1.1 Comparison of the Short Put with the Covered Call.

The profit graph of the naked short put is given in Figure 7.1. Notice that this graph is identical to the profit graph for the covered call (Figure 2.2). Two strategies with exactly the same profit graph are called **equivalent**. This does not mean that the strategies are identical in every way, only that the returns will be similar over the same range of stock prices. Put another way: If your view on a stock is neutral to mildly bullish but you can't sell covered calls because you don't own shares, you can achieve similar results by selling naked puts.

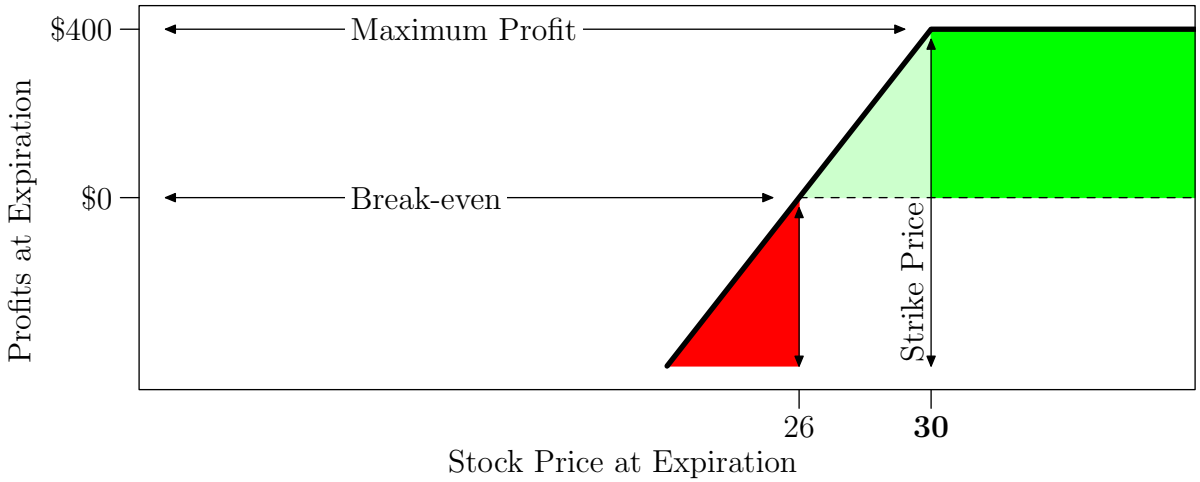

Figure 7.1: Profit graph for naked put.

The maximum potential profit from a naked put position is the total premium received, less commissions. To realize the maximum profit from an out-of-the-money put, the underlying stock only needs to stay above the strike of the put. To get the maximum profit

[1] Collateral is calculated as a percentage of the current stock price, so it can change during the time you hold the put.

from an in-the-money put, the stock must rise to at least the strike price of the put. If the stock doesn't go up, you must buy back the put to avoid assignment, which will reduce your profit. This is exactly the same as the situation with covered calls. For both covered calls and naked puts, when you open a position with a strike price that is above the stock price, there is a better chance of getting the maximum profit. The only difference is that when the strike price is above the stock price, the put is in-the-money, while the call will be out-of-the-money.

Selling an in-the-money put gives greater potential profits. It pays more more up front — in-the-money-options are always more valuable. But remember that if the stock price does not go up, you will need to spend at least some of that money to buy the put back. Like an out-of-the-money call, the in-the-money put provides greater potential profits but less chance of actually achieving them.

Your downside risk is greater with an in-the-money put. Recall that the deltas of in-the-money options are higher than the deltas of out-of-the-money options. This means that if the share price goes down, the repurchase cost of the in-the-money put will go up faster than the repurchase cost of the out-of-the-money put. Selling an in-the-money put can potentially lose you money at a higher rate of speed. This is also similar to selling an out-of-the-money call, which provides less downside protection than an in-the-money-call.

It is sometimes argued that there is an advantage to covered calls over naked puts for dividend paying stocks. It's true that the covered call seller will receive the dividend as part of his stock ownership, while the naked put seller will not. But as been mentioned before, call premiums are decreased in dividend paying stocks, while put premiums are increased, so there is less of a difference between these two situations than appears at first glance.

It may seem like there is a big difference between selling a naked put and selling a covered call, but this is probably more rooted in perception than reality. Covered call selling is certainly familiar to investors who are used to holding stock. Selling naked puts is considerably less familiar. Even though the strategies are equivalent, it is rare to find an investor who participates in both.

7.1.2 So I Sold a Naked Put, Now What?

If the underlying drops, you may need to take some action to protect yourself. The simplest is to just close the position, usually at a small loss. Because in-the-money puts lose time value premium pretty quickly, you may find that your loss is actually small if the stock goes against you.

With covered calls, it is generally a good idea to roll down whenever reasonable. This is because there is an existing stock position to consider. Buying back the covered call may still leave you with a loss in the stock — rolling down the call can help with this. And closing the covered call position completely may involve extra commissions. The situation is different with naked put selling. You don't own any stock, so your only loss is from the put. You could roll the put down, but there may be opportunities elsewhere in the market

that are better. You should consider this and take advantage of them if you find them.

The same considerations apply to rolling forward. Because you also own stock when you have a covered call position, it is a big advantage to roll forward when you have a covered call. This gives you more premiums without disturbing your stock position. Rolling forward can also be profitable with puts, but because the put seller doesn't have an underlying stock position, he should evaluate all possibilities before doing so. It may be more profitable to sell a put against another stock.

7.1.3 Evaluating Naked Puts

There are many differences of opinion on how to evaluate the returns from selling naked puts. Many investors feel that they aren't really investing anything, since the puts are secured with collateral from their portfolio. However, particularly when the puts are secured with cash, in my opinion it is more honest to include the total amount of collateral required when calculating the return. With puts, as with calls, there are two returns to consider: the maximum potential return, and the return if unchanged. If the put is out-of-the-money, then the return if unchanged is the same as the maximum potential return. If the put is in-the-money, then the cost to buy back the put at expiration must be included in the calculations.

Example

Fuzzy WooWoo's Art Supplies Inc. is selling for $30 and there is a March $30 put which sells for 4-points. You decide before investing that you will close the position if the shares drop to $23. What are the potential returns if you decide to sell 5 puts?

Potential Profit:	
Sell 5 Puts @ 4 points	$2,000.00
Less Commissions	-12.70
Potential Profit	$1,987.30
Break-even:	
Strike Price	$30.00
Less Premium per put ($1,987.30/500)	-3.97
Break-even stock price	$26.03
Collateral required: 500 times 30	$15,000.00
Less Premiums Received	-1,987.30
Net Collateral	$13,012.70
Potential Return:	
Potential Profit	$1,987.30
Divide by Net Collateral	13,012.70
Maximum Potential Return	15.3%

Since the put is out-of-the-money, the maximum potential return is the same as the return if unchanged.

Once the maximum return and break-even points have been calculated for all puts you are considering, you can rank put possibilities by both criteria. If you focus on the list with maximum returns, do not neglect to consider the downside protection the put provides. For example, for a stock selling at $100 a share, a $50 put would pay a huge premium, but offer no safety at all. You should allow at least 5% worth of downside protection, and reject any put that does not provide at least this much.

If you rank your puts by the protection they afford, you shouldn't forget about your profits. For example, a deeply out-of-the-money put would provide little chance of loss, but it would also pay very little. Considering commissions and the collateral required, it would not be worth selling such a deep-out-of-the-money put.

As with calls, to compare puts with different expiration periods against each other, you must annualize the returns, comparing them to your personal minimum yearly return before you invest. More discussion of this topic can be found in subsection 2.6.4.

More advanced put selection would also consider the volatility of the underlying stock, but this would take us out of the realm of an introduction to options.

It is never a bad idea to consider the fundamentals of the underlying stock when you are looking at any option play. Knowledge of the stock and the company will only help, because the stock is always your best friend when it comes to moving the price the way you want it to go. Examine the stock as closely as if you were going to buy it, looking at its financials and the economics of the business.

7.2 Using Puts to Buy Stock Below Market

Another use for selling naked puts is to potentially acquire shares at below market prices. Limit orders can be used to do this, but selling puts is often better. Puts can give you a better chance to get the shares, and if you don't get them, the put premium compensates you for your disappointment.

Example

You see a $30 stock that you would be willing to buy if it reached $25. If you open a good until cancelled limit order to purchase the stock at $25, the stock must actually reach $25 in order for your order to be executed. The stock may drift around between $25 and $30 for the duration of your order, and you will never get the stock.

But if you are able to sell a naked put with a strike of $30 for a premium of $5, the chances are good that you will get your shares. If the stock closes anywhere below $30 at expiration, the shares will be assigned to you. Meanwhile, since you were paid $5 for the put, the effective purchase price of the shares is $25.

If the share price doesn't cooperate, and continues upwards to close at $33 by expiration, you keep the $500 you were paid for selling the put, and can try again. And you have made some money while you waited.

Selling puts to obtain stock can modify the criteria for selecting puts. If you are more interested in the stock than the premiums from the put, you may be more willing to consider an in-the-money put.

EXAMPLE

Arlo's Organic Methane Manufacturing Company shares are selling for $48. You would be willing to purchase shares anywhere below $50, but of course would like the lowest price you can get. There is a March $50 put which is selling for $4.75. Ignoring commissions for the moment, this would give you an effective purchase price of $45.25.

If you also believe that Arlo's shares are unlikely to drop below the next strike price ($45), this gives you even more encouragement to purchase the in-the-money put.

If you are highly interested in obtaining shares, you should be more willing to roll-down if the stock drops further. This will usually be a net-debit transaction, so you need to consider your total costs carefully. If your purpose is to acquire shares, rolling forward for a net credit, even if the put is in-the-money, should be considered. This will reduce your effective purchase price in the shares by the amount of the credit received.

Just as you shouldn't chase a rising stock forever when you have a covered call against it, you should also use good sense when you chase a stock on the downside. In some cases, it may be best to accept the loss. If you have lost interest in the stock, you can buy the put back and accept the loss. If you are still interested in the shares, you can accept the loss by paying a higher than market price for them. If the difference between your effective share price and the market price is not too great, it can usually be made back fairly quickly by selling calls or by dividend payments from the shares.

7.3 Use Caution With Naked Puts

Naked put writing is a relatively safe activity, but some care is required because it can also be dangerous. Large losses are possible if the stock plummets suddenly. Also, particularly if you are using a margin account, it is easy to over-leverage your position. Many people have been wiped out by selling hundreds of out-of-the-money puts on "safe" companies like IBM or AT&T, forgetting that there is rarely a year that goes buy that doesn't see a serious decline in at least one major companies stock.

This is much less of a problem if your broker requires you to use cash to secure the full amount of the puts. Naked call writing, intelligently used, while a reasonable safe activity, remains inherently riskier than covered call writing.

7.4 Up to the Minute Summary

- Selling naked puts can be used to generate income, or acquire stock at below market prices.
- You will probably be required to have enough cash to purchase the shares, if you are assigned.
- Covered calls and naked puts are equivalent positions.
- Selling an out-of-the-money put is less profitable, but also less risky, than an in-the-money-put.
- In-the-money puts pay more, but also have greater risk.
- Rolling can be profitable, but there is less advantage to roll puts than there was with covered calls, because you don't own the stock.
- It may be more profitable to close a position, even at a small loss, then roll the call. There may be better put selling opportunities available.
- Do not over-leverage yourself when you sell naked calls, and monitor positions carefully to keep yourself from large losses.

7.5 Chapter Glossary

Equivalent Positions Positions with the same profit graph. For example, covered calls and naked puts have the same profit graph, so they are equivalent. This does not mean they are "the same in every way".

Limit Order Limit orders instruct your broker to buy or sell securities above or below a certain price. For example, an order to buy a security with a limit of $25 will only be filled when the price of the security is $25 or less. This can result in partial fills or even not obtaining the desired security. If you sell a security with a limit of $25, it will only be sold if a buyer can be found to purchase your security at or above that price.

8 Put Buying

Chapter 1 on option basics and chapter 6 on puts should be read before beginning this chapter. Section 3.4.1 may also be helpful.

8.1 Buying Puts

One common reason for buying a put is to make a profit when the stock price goes down. It is equivalent to shorting stock, just as buying a call is equivalent to being long stock. The advantages and disadvantages are similar to buying calls. Advantages first:

Example

Shares of Xaio Mei's Lovely Pens are trading at $30 a share. There is a March $30 put which sells for 5-points. You purchase the put, and Xaio Mei's stock soon drops to $20. The put is now selling for $17, with a profit of $1,200 on a $500 investment.

Should the stock go up instead, you will have a loss, but your loss is limited to your initial investment of $500.

There are considerable advantages to buying puts instead of shorting stock. The short sale of stock has unlimited risk — should the stock rise instead of fall, your loss will grow dollar for dollar with its rise. Short sellers must also pay the dividends on the stock, while the put seller has no such obligation. There can also be charges imposed by your brokerage for borrowing shares on your behalf. With no obligation to pay dividends or fees, combined with the limited risk of the put, buying puts instead of shorting stock looks very appealing.

Figure 8.1 gives the profit graphs comparing the purchase of an at-the-money put with the short-sale of stock. The purchase of the put underperforms the short-sale by the amount of time value you purchased with the put. Note that the short-sale profit curve does not account for the costs associated with shorting, such as the amount paid to your broker to borrow the stock. If those had been included, this small difference would be even less.

The short-sale sale wins if the stock remains unchanged or drops after the put has expired. On the other hand, if the stock increases, the long put is the clear winner for risk management.

The problems with put buying are the same as for call buying: you must be right about the stock, and the market must recognize this during the lifetime of the option. Short positions are difficult, perhaps more difficult than long positions in stock. Like long calls and unlike most option strategies, long puts require precision.

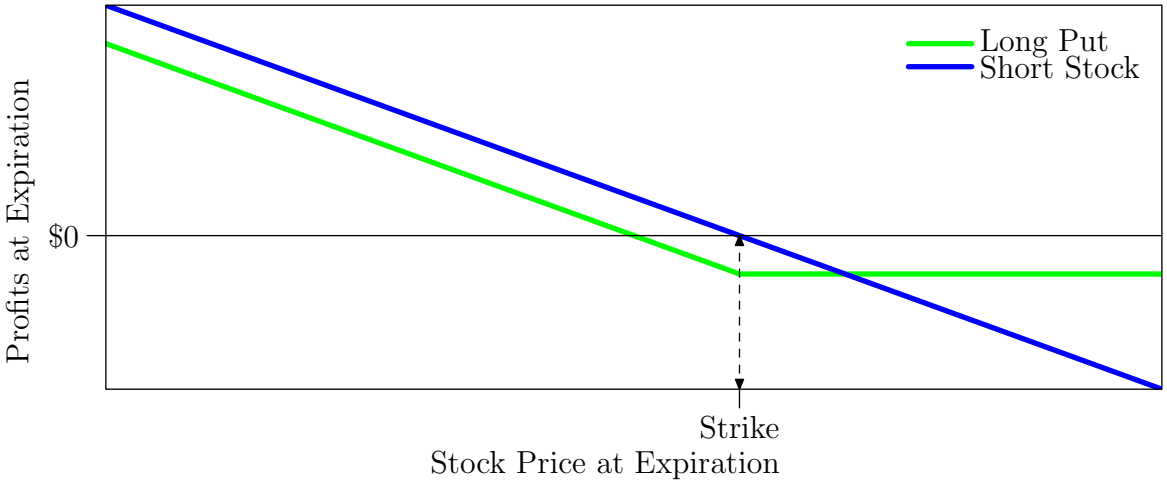

Figure 8.1: Profit graphs comparing a short sale of stock with the purchase of an at-the-money put.

8.2 Put Selection

The considerations are similar to purchasing calls. You may wish to review chapter 3 which goes into more detail. This section will concentrate on the details specific to puts.

Out-of-the-money puts are the high risk, high profit choice. Since they cost less, the returns are much larger — when you get them. However, the stock must fall more for the profits to be realized. The in-the-money put is the safer choice.

Example

The table below gives the profits at expiration for a stock at $39 and two puts, a July $35 put for 1-point and a July $40 put for 3-points.

Stock Price	July $35	July $40
30	400	700
34	0	300
37	(100)	0
40	(100)	(300)

If the underlying drops to $30, the out-of-the-money July $35 gives a 400% return, compared to the 233% return of the in-the-money put. But note that the break-even point for the out-of-the-money put is $34 — it loses everywhere above that point. It's worth noticing that when the out-of-the-money put buyer manages to break-even, the in-the-money-put owner has already made a 100% return on their investment. Unless the stock makes a fairly severe decline, the in-the-money put would be the best choice in this situation.

Since time value decays much faster for in-the-money puts than in-the-money calls, you would not usually hold the option until expiry, because time value decay would eat into your profits. For this reason, taking your profits early is even better advice for put buyers than it is for call buyers.

The rapid decay of an in-the-money put's time value creates additional problems for the purchaser of the out-of-the-money put. When the out-of-the-money put moves into-the-money, the time value may decay faster than the intrinsic value grows.

EXAMPLE

For the prices in the previous example, if the stock fell to $34 shortly after purchasing the $40 put, you will probably find that the put increased by about 2-points. This would be a disappointment after seeing a 5-point stock movement in your favor, and is much less than you would get from a long call with a 5-point move to the upside.

Call buyers, especially those with short time-horizons, must often avoid the longer-term options because the extra cost is not worth the risk involved. But the situation is not the same with puts. Once puts are in-the-money, the time value will drop across all the series, and you can often get a longer-term put for very little extra money. If you can get a longer term put for almost the same price as the near-term put, you should purchase the long-term one.

EXAMPLE

Here are some typical prices for $40 puts on a stock selling at $36:

	June	September	December
$40 Put	4.0	4.50	5.0

As you would expect for in-the-money puts, there is very little time value here. The December put is 6-months away from the June put, but it only has a single point of additional time value. You might as well purchase the December put. If you do so, and the stock declines right away, you will profit, but less than if you had bought the June put. On the other hand, if the stock price recovers, time value will increase in all of these puts, with the December put increasing the most. Here's the situation with the stock at $40:

	June	September	December
$40 Put	1.0	2.50	3.50

Clearly the December put suffered the least loss, and this is completely due to the additional time.

8.2.1 Put Deltas

The concept of the delta of an option was introduced in subsection 3.4.1 in the context of buying calls. Please review that section if you need to brush up on the basics of option deltas.

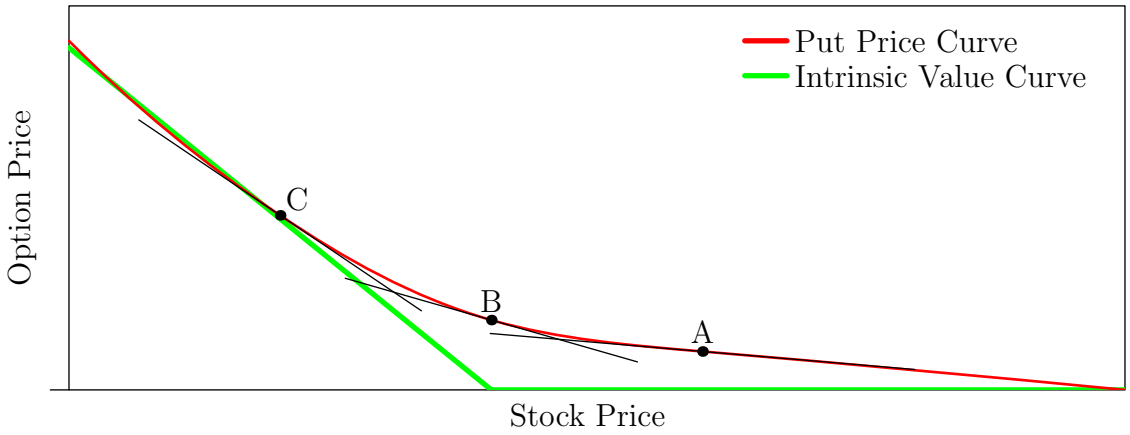

Figure 8.2: The delta of a put option.

Recall that the delta of an option is the amount that the option premium will change as the stock moves up or down. For example, a call option with a delta of 0.50 will move up 1/2 point every time the stock moves up by a full point. Since put premiums increase when the stock price decreases and vice versa, *the delta of a put option is negative*. A put option with a delta of -0.50 will move *down* 1/2 point for every point the stock moves *up*. There is an interesting approximation that relates put and call deltas:

1 = Delta of Call - Delta of Put

This is accurate unless the put is very deep-in-the-money. Because of the differences in the behavior of time-value between puts and calls, a simple linear equation such as this could not model the deltas for all premiums.

As we did in subsection 3.4.1, we can use a ruler and a pencil to approximate the put delta. Recall that by laying a ruler so that it intersects just one point on the options price curve, and drawing a line with a pencil, we get a straight line whose steepness or **slope** is the delta of the option at that point. Figure 8.2 shows the result. As expected, the slope of the pencil lines is *downhill* or negative. And as with the call option, slopes at either end of the put's price curve are very close to the put's intrinsic value line.

Since the intrinsic value line of a put has a slope of zero above the strike, and a slope of -1 below it, we can use this fact to approximate the deltas of the puts. The delta of a deeply out-of-the-money put, which is very near the intrinsic value line on the right, must be very close to zero. At the opposite end, the deep-in-the-money put must have a delta very close to -1. Note that as the underlying stock begins to decline in price, the put's

delta decreases slowly at first, and would then decrease faster as the stock moved through and below the strike price. It gets very close to -1, as low as it can go, when the stock is only moderately below the strike. This highlights the fact that an out-of-the-money put holds on to its time premium very strongly, and an in-the-money put comes to parity very quickly.

8.2.2 Using Volatility to Select Puts

As has been mentioned several times during this book, the volatility of the stock should be a consideration when selecting short-term options. The mathematics of volatility are forbidding, and won't be given here. However, the interested reader is referred to the section 4.5, where a method for approximating volatility was outlined.

8.3 So I Bought a Put, Now What?

As when buying calls, it is rarely in your interest to exercise the put, unless you are intending to sell the stock in any case. The tactics for handling both winning positions and losing positions with put buying are similar to the ones with long calls.

Note: As with calls, many of these strategies use spreads, which require the use of a margin account and sufficient option approvals from your broker.

8.4 Actions to Take On a Loss

When you are looking at a losing position, the simplest is always to liquidate the position by selling the put. When you are being trampled by the bulls, accepting your loss by selling the put may be the wisest course. But if the situation is not so dire, other actions may be superior.

8.4.1 Convert to a Bear Put Spread

You may remember that when faced with a loss on a long call position, it can be an advantage to convert to a bull call spread (see subsection 3.7.2) to improve the break-even price. When you are in a losing situation with long puts, you may be able to achieve something similar by creating a **bear put spread**.

Example

Shares of Sato's Fabulous Flutes are selling for $35, and you are convinced that the flute market is set to decline. You buy a March $35 put for $3. Shortly after that, the stock rises to $38 and your put is now selling for $1.50[1] With Sato's selling at $38, the March $40's might be selling for $3. You take the following steps:

[1]Notice that the put retains considerable time value. This is typical of out-of-the-money puts.

1. Sell your original March $35 put for $1.50
2. Sell a new March $35 put for $1.50
3. Buy one March $40 put for $3.00

You are now short one March $35 put and long one March $40 put. Since you did this for even money (before commissions), you can view this as a new position that cost you basically what you spent to buy the original March $35 put. Obviously, the less you spend on converting to the spread, the better off you will be.

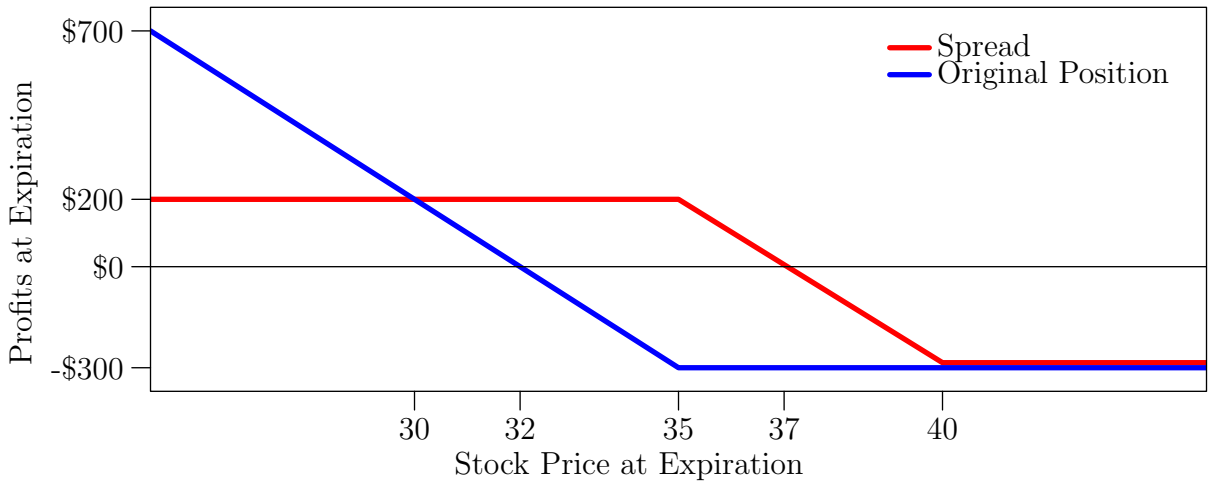

Figure 8.3: Profit graphs comparing original long put with bear put spread.

Figure 8.3 compares the two positions. Since you were able to convert to the spread for even money, you haven't taken on any additional risk. In return, you have raised your break-even point from the original $32 to $37. In fact, you won't reach your maximum possible loss unless the shares reach $40, and you have a position that outperforms the original between $30 and $35. In return for this, you have given up your original unlimited potential profit — the maximum you can make in the spread is $200. However, when you are being trampled, maximum profits are not usually your first priority.

8.4.2 Convert to a Calendar Spread

Something often recommended when you are facing a loss on a long put position is a calendar spread. This is a horizontal spread — the strikes are the same, but the expiration dates are different. In the present instance, you attempt a partial rescue by selling a near term put against the longer one you already hold.

EXAMPLE

As before, you did not appreciate the magnificence of the company that is Sato's Fabulous Flutes, and bought a March $35 put. Sato shares are now selling for $38, and your put is at $1.50. You decide to sell the December $35 put for $1, reducing your loss by 1 point. You are hoping that the December put will expire worthless, and the stock will then drop below $35 before the long call expires.

Aside from the investment thesis here, which is "multiple points of hope", the big problem with the calendar spread is that it makes losses possible in return for little profit. Consider what happens if the stock drops to $35 before December expiration. Because puts hold on to their time value when out-of-the-money, the spread will not widen much. With the stock at $35, the December put would probably be at $1.50 and the March put would be at $2.50. This gives you a loss on both legs of your spread. Plus you have four commissions to pay — two to setup the spread, and two more to liquidate. If you decide not to liquidate and the stock continues to decline, the spread will narrow further as the puts come to parity, and you will end up with an even larger loss.

8.5 Actions to Take on a Gain

As with losses, tactics here are similar to the ones used when you are long calls: liquidate, do nothing, roll down, or create a spread. If those aren't enough options for you, you can also buy a call.

EXAMPLE

You bought a $30 put on Horni Corni's, a Mexican Taco Chain owned by a Pasadena movie mogul, when the shares were selling for $32. The stock is now $25, making the put worth 6-points. The following table summarizes the situation that will be used for each tactic:

	Purchase Price	Current Price
Horni Corni's Shares (not purchased)	$32	$25
April $30 Put	2	6
April $25 Put	NA	2
April $35 Call	NA	3

8.5.1 Liquidate

Liquidating gives a profit of 4-points. This is the easiest and safest alternative. There's no further chance for gains, but there is also no chance for losses. It has a lot to recommend it — the market is an uncertain place and gains are worth having. As with calls, if you own more than one put, you can also consider selling only part of your puts to recover some or all of your initial investment, leaving the rest to run.

8.5.2 Doing Nothing

This is the opposite extreme. Doing nothing is the riskiest tactic, since you could lose your gains or even end up with a large loss. But this tactic will result in the largest gains if the stock continues to move down.

8.5.3 Roll Down

The idea here is to recover your initial investment and then add more leverage. Selling the April $30 would give 6-points. You keep 2-points to recover your initial investment, and then buy 2 April $25 puts with the 4-points remaining. The appeal of this tactic is that it increases your leverage with someone elses money. If the stock continues to fall, you can reap large profits. Should the stock rise, you will lose nothing, since you have completely eliminated your risk.

8.5.4 Create a Bear Put Spread

You sell a $25 put to create a bear put spread. We will cover this spread in more detail in chapter 12, but for the moment, just focus on what can happen in this situation. Since the sale of the the $25 put refunded the money you spent to buy the $30 put initially, you have no risk (other than commissions).

If the underlying rises to $30 by expiration, all the puts expire worthless. This is the worst that can happen — zero profits. But there is no loss. The maximum profit the spread can bring is 5-points, which you will get if the stock closes anywhere below $25 by expiration. This would definitely be the best choice if the stock looked like it was going to close very near $25.

8.5.5 Buy a Call

Being long both a put and a call is an example of a **combination**.[2] The idea behind buying a call is to hedge your position in case the stock goes back up, but retain the possibility of profits. It may seem that buying the April $25 call has increased your total investment cost to 5-points, but appearances can be deceiving. The most interesting thing about this new position is that *it will always be worth at least 5-points.* This means you have reduced

[2]This particular combination is known as a **strangle**, which is discussed further in chapter 10.

your risk to zero, and anything that follows will be pure profit. If the stock closes above $30 or below $25, you will make money. Here are some examples:

Horni Corni's Shares	$26	$32	$23
April $30 Put	4	0	7
April $25 Call	1	7	0
Net	5	7	7

This would be the best tactic if the stock has a tendency to make dramatic moves up and down.

8.5.6 Which Tactic is Best?

As with buying calls, the only answer to this question is: "It depends." The combined profit graph for all these tactics, shown in Figure 8.4, is starting to look like the New York City subway map. All of them are the best at one time or the other. The spread is never the worst one. The only strategy that gives a loss is doing nothing. Absent a strong reason to choose another strategy, either the combination or the roll-down would seem to be the most appealing. If you have a large enough position, any of these tactics could be used in part. For example, if you had 8 puts, you could sell four of them, and use the remaining four in any of the above strategies.

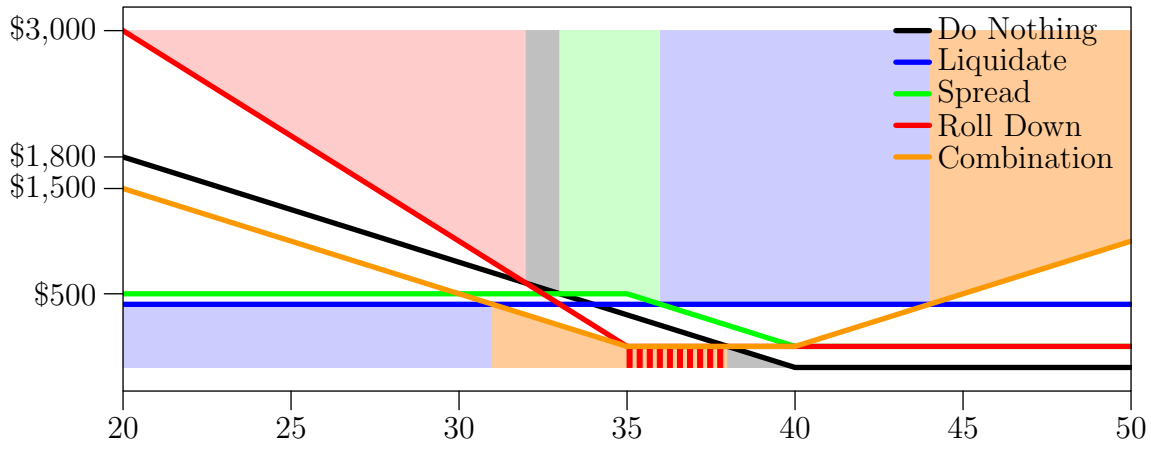

Figure 8.4: Profit graphs comparing the various tactics for managing a winning position.

8.6 Up to the Minute Summary

- You can buy puts instead of shorting stock.
- It gives leveraged returns and limited risk.

- Shorting is difficult. You must be precise and the market must agree with you before the put expires.
- Selling out-of-the-money puts is more profitable, but more risky.
- In-the-money puts are the safest choice.
- Because time value drops so rapidly when the put is in-the-money, it makes sense to buy the farthest put you can.
- The delta of a put is negative, and moves between 0 and -1.
- Unless the put is very deeply out of the money, 1 = Delta of Call - Delta of Put
- When you have a loss, you can liquidate. This may be the best option if the stock is moving strongly upward.
- You can convert to a bear put spread if you have a loss.
- The less you spend on the conversion, the better. It is ideal if you can do it for even money.
- The bear put spread limits your profits, but increases your break-even point.
- You can convert to a calendar spread when looking at a loss. This is inferior to closing the position or the bear spread.
- When looking at a gain, you can
  1. Do nothing at all.
  2. Liquidate (i.e. close the position)
  3. Roll down to more puts.
  4. Create a bear put spread.
  5. Buy a call to create a combination.
- All tactics perform well in different scenarios.

8.7 Chapter Glossary

Combination A position involving puts and calls on the same underlying stock.

9 Covered Put Buying

Chapter 1 on the basics, chapter 6 on puts and chapter 8 cover the material you need to know before you tackle this chapter.

9.1 Buying Puts as Insurance on Long Stock Positions

Another reason to buy puts is for downside protection on stock you already own. In effect, the long put acts as an insurance policy against a possible drop in the stock's price.[1] The cost of the puts reduces your net profits, but may be prudent in certain circumstances.

Example

You own shares of Nate's Hardware Store which are selling for $42. You buy a March $40 put for 2-points. No matter how much Nate's goes down by March expiration, the most you can lose is 4-points, since the put will gain a point for every point the stock declines below $40. You will lose 4-points because you spent 2-points on the put, and will lose 2-points from the share price decline from $42 to $40.

If the stock increases instead of declines, you lose 2-points of upside — the price of the protective put.

Figure 9.1 compares the different outcomes of holding stock versus stock plus a protective put. If the stock declined below $38, you would be better off (potentially much better off) owning the combined position. On the upside, the put purchase proves to be small drag on your profits.

9.1.1 Who Should Buy Protective Puts?

Insurance costs money, and covering every stock position in your portfolio with a protective put at all times will significantly impact your earnings. Even the most cautious investor would be advised not to engage in a full scale program of "put insurance".

One circumstances where buying protective puts may be justified are negative macro-economic events. As we all know, macro-considerations can cause a broad market decline, even if the individual companies are still performing well. If you also have long-term holdings where capital gains taxes would prove significant, selling puts in a strong bear

[1] The combination of long stock plus long call is also known as a "synthetic long call" because the profit graph is the same shape as a long call.

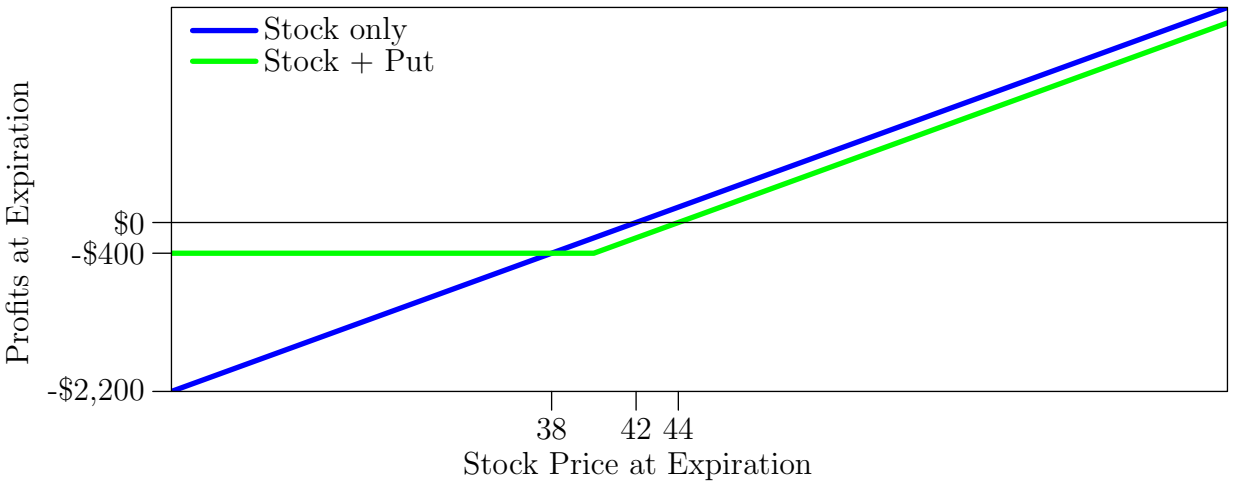

Figure 9.1: Profit graphs comparing a stock only position with stock plus a long put for protection.

market may make sense for you. This allows you to protect your profits and still benefit from holding shares when the market recovers.

You may own shares in a company which has reached a "make-or-break" point in their business cycle. This may be a decision from a government agency, a lawsuit, or other circumstance where, should the circumstance move against the company, might send the shares into a bottomless pit. The uncertainty of this situation can be dealt with very nicely with a protective put. Selling the put protects your current profits in case of a disaster, while allowing you to benefit from most of the upside.

Using Puts Instead of Stop-Loss Orders.

A stop-loss order is an instruction to your broker to sell shares if the stock price drops below a certain limit. Many outstanding investors, notably Peter Lynch, have written about the perils of the stop-loss order and advised investors not to use them. Stocks often move down 10% or 20% while making an overall upward move that will eventually provide great profits to their owners. If your stop-loss order triggers in the course of such a move, you may end-up having to repurchase shares at a higher cost-basis. You will also pay more commissions and probably more frequent taxes. Do this often enough and most of the advantages to stock ownership are gone.

For investors who are addicted to stop-loss orders, a protective put would probably be a much better choice.

9.2 Protective Put Selection

Out-of-the-money puts cost much less, but provide less protection. Near-to-the-money and in-the-money puts cost much more, but provide substantial downside protection. As with any insurance policy, you must balance the cost of the insurance against your best estimate of losses without the insurance.

Buying a put which is very far out-of-the-money is more like disaster insurance. There are definitely circumstances where this would make sense, but for most stocks, the purchase of a way out-of-the-money put is simply wasted money, no matter how little it may cost you.

Example

A stock selling for $45 has a March $35 put which sells for $0.50. While the purchase of this put will have a minimal impact on future earnings, the purchaser will lose 10.5 points if the stock fell to $35 or below.

On the other hand, a deeply-in-the-money put provides huge amounts of protection, but will greatly limit any future profit potential.

Example

The same stock selling for $45 has a March $50 put selling for $5.50. This gives protection below $39.50 which is good, but it also means that the stock must now rise to $50.50 before the shareholder starts recognizing additional profits. This may prove unlikely.

For most cases, neither of these is a good strategy to follow. Generally speaking, *a slightly-out-of-the-money put will probably provide the best balance of protection without limiting the profit potential of owning the shares.*

If you compare the profit graph of the long put + long stock position to the profit graph of the long call, you will find they are exactly the same. This means that the combination of long stock + long put is *equivalent* to the long call position. This doesn't mean they are the same in every detail (for example, a share holder would receive dividends, while the call buyer would not), it only means that profit potential of each position is the same. Thus it should not come as a great surprise to learn that just as the slightly in-the-money call offered the best balance of risk and reward for covered calls, the slightly out-of-the-money put will offer the same balance of risk and reward to the shareholder who is looking to protect his stock position.

9.3 Tax Considerations

Under current tax laws, the purchase of a long put to protect your stock can impact your taxes. If you are a short-term holder at the time you buy the put, you eliminate any holding period you may have accrued. In addition, the holding period does not begin again until the put is sold.

EXAMPLE

Let's assume that you must hold a stock for 12-months before it is considered a long-term holding by the IRS. If you had held a stock for 11-months, and then purchased a put, you would negate your entire 11-months of holding time for tax purposes. Furthermore, if you held the put for four months before you sold it, these months would not count towards your new holding period.

In other words, you can hold the stock for 15-months, and your holding period is still counted as zero for tax-purposes. Isn't that charming?

If you are already a long-term holder of the stock at the time you purchase the put, or if you buy the put at the same time as you buy the stock and identify it as a hedge, there is no tax-effect.

Tax laws change and your personal circumstances can also affect them. The file

http://www.optionseducation.org/resources/literature/files/taxes_and_investing.pdf.

which is updated regularly, contains much useful tax information for investors.

9.4 Using Puts with Covered Calls: The Collar

Covered calls were discussed in chapter 2. If you aren't familiar with that strategy, please read that chapter before continuing.

Simultaneously selling a call against stock you already own and also buying a put is called a **collar**. Since the covered call already provides downside protection from the premium you receive, you can buy a farther out-of-the-money put. In some cases, the premium from the covered call will pay for the purchase of the put.

If you are interested primarily in the downside protection of the covered call, this strategy will probably appeal to you. Of course, the purchase of the put does reduce the additional income you can receive from selling the calls against your stock.

EXAMPLE

A stock selling for $29 has an April $30 call selling for 3-points. There is also an April $25 put selling for 1/2-point. If you sell the call, you have a maximum profit of 4-points

if the stock closes above $30 by expiration. You receive protection against losses down to the break-even of $26.

If you use some of the call premium to purchase the April $25 put, you reduce your profit slightly to 2.5-points, but have greatly increased your downside protection. The break-even point of the call is raised by the put purchase to $26.5, and the put protects you anywhere below $25. Therefore the most you can lose, even if the stock should drop to zero, is 1.5-points.

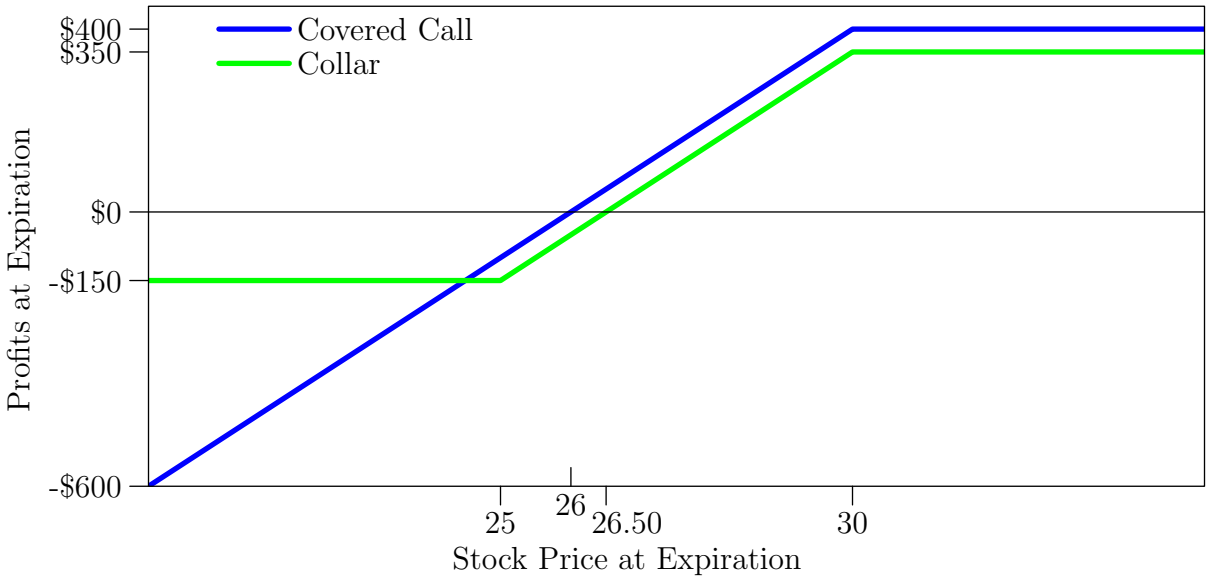

Figure 9.2: Profit graphs comparing a covered call position with a collar.

Figure 9.2 shows the profit graphs for both the covered call and the collar. As discussed above, the graph illustrates that the break-even point is raised slightly and the profits are reduced slightly. However the maximum risk is very small. Before deciding to use a collar, carefully calculate the total costs involved. There is a detailed example of the covered call calculation in section 2.6.3, which shows how to include commissions and any dividends that will be received. To this you must add the cost of the put plus commissions.

There is a lot to recommend the collar. If it can be done at a relatively low cost, it makes the strategies in section 2.8 for dealing with losing positions obsolete. Consider the rolling down strategy: The disadvantage of rolling down in a covered call position is that it reduces your upside if the stock reverses direction and begins to climb. This is not a problem with the collar. With the collar you also completely eliminate the potential misery of a locked-in loss. With a collar you need not take any action at all and can just leave the position alone to make money for you if the stock recovers.

Against these advantages must be stacked the fact that your overall rate of return will

be reduced. And it is arguable that the downside "gain" you receive from the collar is of little benefit in the majority of cases, since the odds of a stock falling dramatically are small compared to other possibilities, such as falling slightly, staying the same, or rising. On the other hand, many investors have difficulty controlling their emotions when faced with even a small loss. The collar can free these investors to deal with the situation more rationally, since it can so effectively reduce dramatic losses.

If you compare the profit graph of the collar to the profit graph of the bull call spread, you will see that these are equivalent positions.

9.4.1 Partial Collars

You can get quite creative with collars, particularly if you have large positions.

EXAMPLE

You own 1,000 shares of of a stock which is selling for $41. You sell 5 March $45 calls for 2-points each, and 10 March $35 puts for 1-point each. The sale of the calls completely covers the cost of the puts, protecting your entire position below $35, while leaving half of your position with unlimited profit potential.

The lower the strike you use for the put, the fewer calls you will need to sell to pay for them. Of course, the lower the strike, the less downside protection you have, but since this falls into the category of "disaster insurance", and you are getting it for free, this may help you sleep better at night without costing you anything.

9.5 Up to the Minute Summary

- Purchasing a put while owning shares of the underlying acts as an insurance policy against price decline in the shares.
- Insurance costs money. Buying a put on every stock you own is probably a waste of money.
- Puts can be used instead of stop-loss orders.
- Slightly out-of-the-money puts usually provide the best balance of protection and potential profit.
- Purchase of a put while owning the stock can affect your holding period for tax purposes.
- Selling a collar (a long put, short call plus underlying stock) can help pay for the cost of the protective put.

1. Collars eliminate the need for extensive follow-up action in a covered call position.
2. Collars will reduce your overall rate of return.
3. Collars can be used as "disaster insurance". Disasters may be unlikely, but having insurance against them can make some investors sleep better at night.
4. If you have a large stock position, partial collars can be employed to protect the entire position, but leave room for more profits.

9.6 Chapter Glossary

Collar A position involving the purchase of a protective put and a short call. It is safest if it is combined with a covering long stock position, to keep from owning a naked call.

Synthetic Call A long put combined with a long position in the underlying stock. This has the same profit graph as a long call position.

10 Strangles and Straddles

Chapter 1 on option basics, chapter 2 on covered calls, chapter 6 on puts and chapter 8 on put buying are useful background for this chapter.

Since we introduced using long puts and short calls to create a collar in the previous chapter, we might as well continue this theme. Two other useful combinations of puts and calls are the **strangle**.and the **straddle**.

10.1 Using a Put to Lock In Profits From a Long Call: The Strangle

If you have purchased a call which has since gone up in price, you can buy a put to "lock-in" some of your profits. The combination of a long call and a long put with different strike prices is called **buying a strangle** or a **long strangle**.

Example

You bought a call March $30 call on Sato's Silvery Flutes for 3-points when Sato's stock was selling for $28. Now Sato shares are selling for $38 and your call is selling for 9-points. There is a March $40 put which sells for 4-points. You buy the put, creating a strangle. Here are your total costs to date:

Long 1 March $30 call:	3 points
Long 1 March $40 put:	4 points
Total Cost:	7 points

This is a position where it is impossible to lose money, which is not a bad position to be in. Having paid 7-points for the two options, the minimum you can make is 3-points, and your upside is unlimited.

If Sato's closes anywhere between the two strikes at expiration (between $30 and $40), the combination will be worth 10-points. For example, should Sato's close at $34, down four points from its current price of $38, the long call will be worth 4-points, and the long put will be worth 6-points.

If the stock closes outside the strikes at expiration, the strangle will be worth even more money. If Sato's closes below $30, the call expires worthless, but the put will be worth more than $10. And if the stock closes above $40 at expiration, the put will be worthless, but the call will be worth more than $10.

Unfortunately, you can't create this situation as an initial position — you have to wait until the call has appreciated enough to make it possible. Strangles can be used as opening positions, but in that case you won't find it impossible to lose money. You can also use a strangle to lock-in the profits from a put. This was described briefly in section 8.5.5.

Do not let the magical properties of this situation blind you to the fact that may you have given up 6-points of sure profit from your long call position for 3-points from your strangle. If the stock is volatile and the time to expiration is distant, a strangle may provide you with a happier ending. You may also find yourself wishing you had just sold your call when you had the chance.

10.1.1 Buying Strangles as an Initial Position

You may occasionally find yourself in the position of considering a stock for purchase which seems to have equal chances of a tremendous upside and tremendous downside. Such situations can be found with small biotech startups. These firms are typically "one product wonders" and the success of the company hinges on whether or not the FDA will approve the drug or device. In an unusual case like this, where the least likely scenario is that the shares will trade in a narrow range, a strangle makes a good deal of sense as an initial position:

Example

Peter's Prostate Pills, a biotech with a new cure for prostate cancer, is currently trading at $37 a share. The FDA will announce its decision on May 1, at which point you expect the shares to either rocket to the sky, or fall into the ground. The May $30 puts are selling for 2-points and the May $40 calls also sell for 2-points. You purchase one of each, establishing a strangle.

It is clear from the profit graph in Figure 10.1 why you want to avoid a stock that may have a stable price when using a strangle. While the potential profits from a strangle are huge, the maximum loss is possible over a rather wide range. In the present case, if Peter's Prostate Pills closes anywhere between $35 and $40 at expiration, you will lose your entire investment.

This example demonstrates an out-of-the-money strangle, which is probably the most common type. You can also buy an in-the-money strangle:

Example

With Peter's Prostate Pills at $37, you decide to use in-the-money options. There is a May $35 call selling for 4-points and a May $40 put also selling for 4-points. The cost for this is twice the cost of the out-of-the-money strangle (8-points versus 4-points), but the value of the combination will always be worth at least 5-points, since the put is 5-points

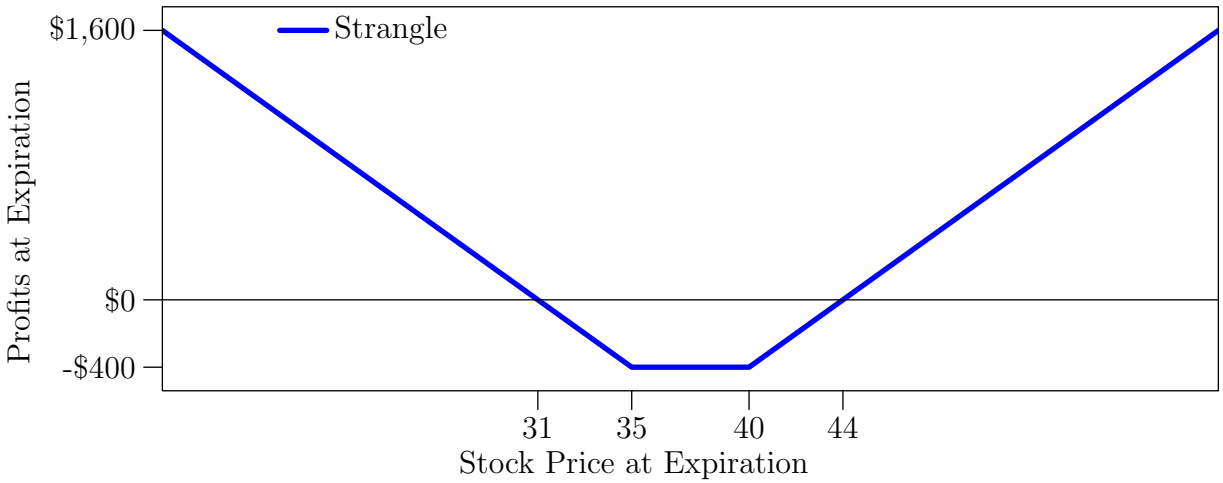

Figure 10.1: Profit graph of an out-of-the-money strangle.

higher than the call. This means the most you can lose is 3-points. Your potential profits remain unlimited in either direction if the stock moves by a sufficiently large amount.

If you are concerned that the stock may trade within a narrow region, buying the in-the-money strangle makes sense, even though it involves a larger initial investment. This follows logically from what you have already learned about buying both puts and calls. For both puts and calls, the in-the-money purchase was the safest, so it shouldn't be surprising that when combining both purchases, the in-the-money position is also the safest.

10.1.2 I Bought a Strangle — Now What?

If the underlying moves rapidly in either direction, you may be able to protect some of your profits. For example, if the stock moved up rapidly, you can roll the put up to the next higher strike. Do not do this automatically. Depending on the actual prices involved, the cost for rolling up may be prohibitive. Study each situation on its merits, and make your decision accordingly.

10.2 Selling a Strangle

When you sell a call and a put with different strike prices, you are **selling a strangle**. Note that this involves selling a call and unless you own enough shares to cover it, you will have a naked call. When you do own enough shares to cover the call, it is called a **covered strangle**, otherwise it is an **uncovered** or **naked strangle**. Naked strangles have their uses, but since they are high-risk positions, and since most newcomers to options would

not have sufficient permissions from their broker to trade them anyway, we won't discuss them further here.

Since you are selling a put, you want to be comfortable with the price you would pay if you ended up being assigned shares. Similarly, since you are also selling a call, you want to be happy with the price you would receive if the shares were called away from you. This is easier to achieve than you might suspect, since you are receiving two premiums, but it is only possible for one of the options to be executed. It should also be noted that you will be required to have enough cash on hand to secure the puts you sell.

EXAMPLE

Nate's Natty Timber Company shares are currently $35 a share. You think the fair value of Nate's is between $32 to $38 a share. You would be happy to get more shares for less than $32, or sell your current shares for more than $38.

The April $40 calls are selling for 4-points, and the April $30 puts are selling for 3-points. You open a short strangle, selling a call and a put for a total of 7-points. If Nate's closes between $30 and $40 at expiration, you keep both premiums.

If the share price drops below $30 and the put is executed, since you received 7-points for the strangle, your effective price for the shares is $30 - $7 = $23 per share — a substantial discount to the current market price and also to your estimate of fair value. On the other hand, should the stock rise to $42 and your call is executed, you are in effect being paid $40 + $7 = $47 a share, a substantial premium to the market and considerably higher than your fair value estimate.

The covered strangle seems to be rarely used by many investors. The additional income from the double premiums would seem to make it an improvement on the covered call strategy. The potential for acquiring more shares at a much lower price or selling the shares for a much higher price is also a nice feature if you are positive about the stock. It seems to me that the covered strangle is a very under appreciated options strategy. Perhaps the necessity to secure the puts with cash or margin are the explanation, but I am always surprised to find that more investors don't exploit it.

Figure 10.2 gives the profit graph for a naked short strangle. That is this position excluding any profits or losses from the stock. As you can see, this is an exact inversion of the profit graph of the long strangle given earlier. Note that while the long strangle has an extended area of loss if the stock doesn't move much, the short strangle has an extended area of maximum profit under the same circumstances. Thus your chances for keeping both the shares and your premiums are typically good with this strategy.

10.2.1 I Have a Covered Strangle, Now What?

Followup action on the strangle depends on which leg of the strangle needs attention. Figure 10.3 gives the profit graph of the total position, assuming execution. Note that

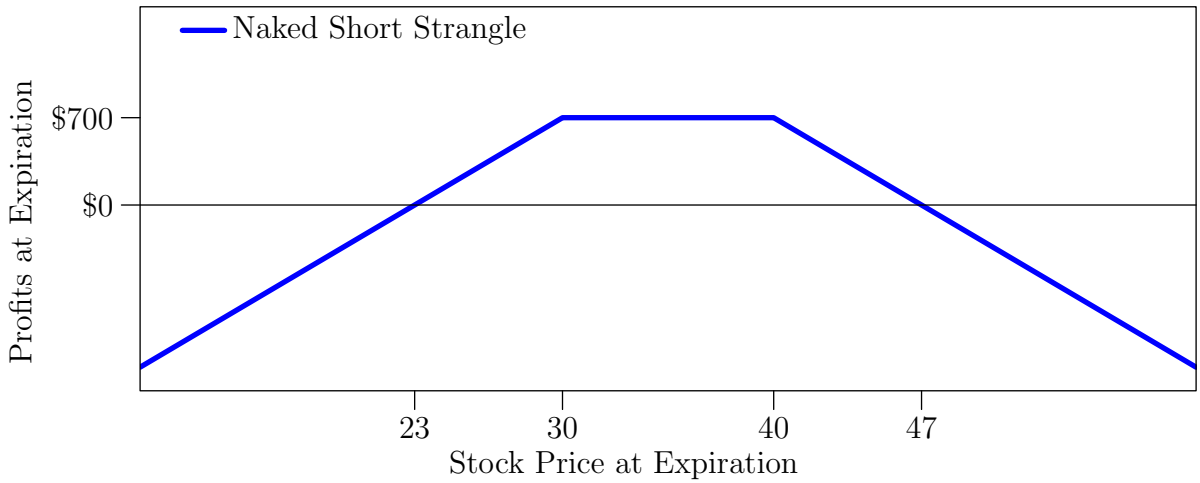

Figure 10.2: Profit graph of a naked short strangle.

profits are enhanced, but so are losses. While one of the ideas behind this strategy is to acquire additional shares at a lower cost basis, if the stock appears to be entering a severe decline, you would be wise to pay close attention to the put. Any of the actions described in subsection 7.1.2 can be tried. The same is true with the call. Should the stock appreciate, you can treat it similarly to any covered call position (section 2.8). If you aren't careful, strangles can involve you in excessive commissions, particularly if the stock see-saws between the two strikes. For example, you might be tempted to roll shares prematurely when the stock nears one of the strikes, only to see it move the other direction. This can be dangerous to your profits, so use discipline.

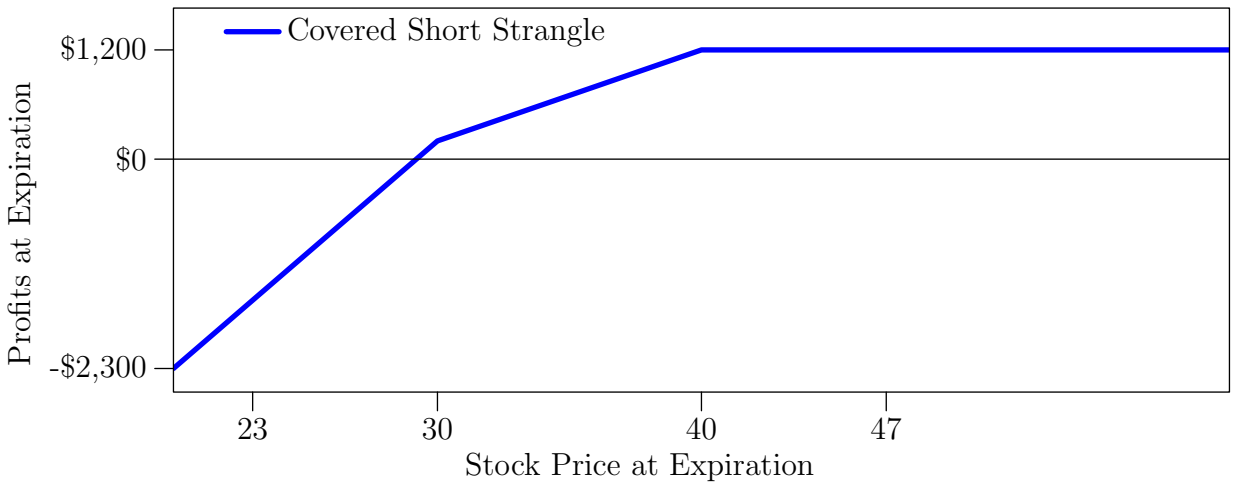

Figure 10.3: Profit graph of a covered short strangle.

10.3 Buying a Straddle

When you purchase both a put and a call with the same underlying, strike price and expiration date, you have bought a **straddle**. Buying a straddle allows you to make large profits if the stock moves far enough in either direction. Your loss is limited to your initial investment.

EXAMPLE

Shares of Sato's Silvery Flutes is selling for $30. You buy a September $30 call for 3-points, and a September $30 put for 2-points, for a net investment of 5-points plus commissions. If SATO stays at $30 at expiration, you will lose your investment, since both options would expire worthless. However, if the stock is above $35 at expiration, the call would be worth more than 5-points and you would make money, even though the put expires worthless. Similarly, if the stock is below $25 at expiration, the put would be worth more than 5-points, and you would make money, even though the call expired worthless. The profits are potentially large on either side, if the stock moves a great distance before expiration.

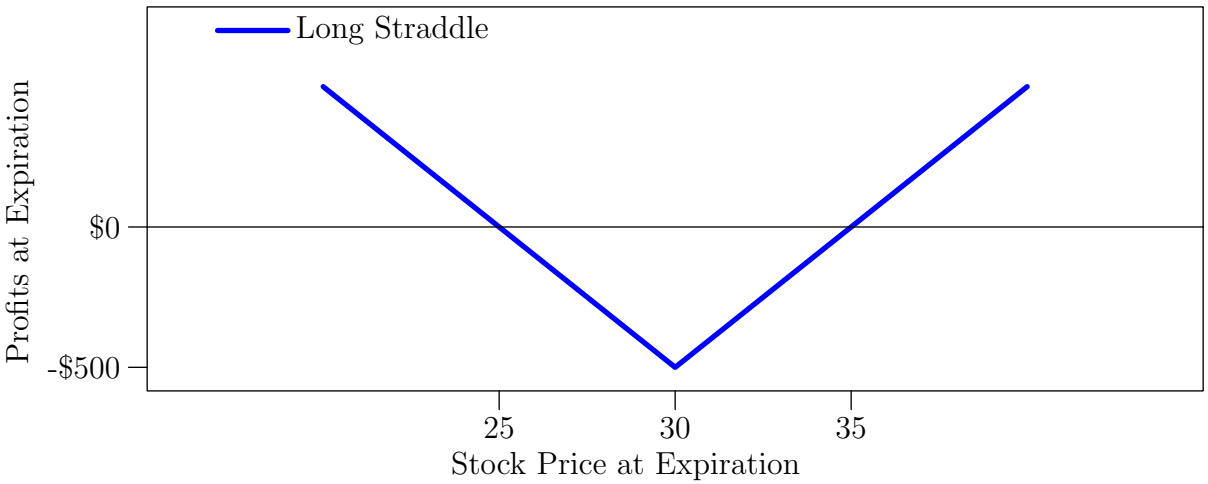

Figure 10.4: Profit graph of a long straddle.

The profit graph of the long strangle is shown in Figure 10.4. As you can see, there are two break-even points, easily calculated, and two ways to make big profits. Straddles are most desirable when premiums are low (to reduce the initial investment) and the stock is volatile. Obviously, this combination is very difficult to find. However, given enough volatility, profits can be made even with higher premiums. Even so, losses can be expected in a large percentage of cases if the straddle is held to expiration. And while theoretically

you can lose your entire investment, in practice, this is unusual. Even on expiration day, the options can be sold for a small amount to recoup some of your investment, and for more money prior to expiration.

10.3.1 The Reverse Hedge

The long straddle is equivalent to shorting the stock and buying two calls, which is known as a **Reverse Hedge**. Should the stock price decline, you will profit from the short position in the stock. If the stock price increases, you will profit from the calls. If the stock remains near the strike, you will lose your initial investment.

The long straddle is generally superior to the reverse hedge because it does not involve a short position in the stock. Short sellers of stock must pay dividends and other fees that option buyers are not subject to.

A Reverse Hedge with Puts

A reverse hedge can also be entered by purchasing the stock and buying two puts. In this case, if the stock rises, the stock position will become more valuable, while if it falls, the puts will become more valuable. As with the long straddle and the other form of reverse hedge, if the stock remains unchanged you stand to lose your initial investment. This is superior to the reverse hedge discussed in the last section because you might receive dividend payments from the stock. However, since it requires a larger dollar investment, it is inferior to the long straddle.

10.3.2 Buying the Best Straddle

In theory, you should be able to find the best straddle by using the criteria for both the best call purchases and the best put purchases. Then if both puts and calls looked worthwhile, the straddle could be entered.

Example

Using our previous example, of Sato's Silvery Flutes:

Sato's Shares:	$30
September $30 Call;	3-points
September $30 Put:	2-points

If we assume that there is a 25% chance of the shares being at $34 and a 25% chance of the shares being at $26 by expiration, we will have one of the following outcomes:

Sato's shares:	\$34
September \$30 Call:	5.5-points
September \$30 Put:	1-point
Net Profit:	6.5-points

Sato's Shares:	\$26
September \$30 Call:	1-point
September \$30 Put:	4.5-points
Net Profit:	5.5-points

So we stand to make either 5.5-points or 6.5 points, for an average potential return of 6-points. Since the straddle would cost us 5-points, this is a 20% profit. You can enter this straddle, or compare with another potential straddle investment to see which is better. Note that you can only meaningfully compare returns from straddles with the same probabilities.

10.3.3 So I Bought a Straddle, Now What?

If the stock moves up to the next strike, you should consider rolling the put up. Using our previous example:

EXAMPLE

Recall that you are long a straddle on Sato's Silvery Flutes, with a September \$30 call and a September \$30 put. Now the shares are selling for \$35. You decide to roll the put up, so you sell the September \$30 put for 1-point, and buy the September \$35 put for 3-points. Since you spent 5-points for the initial straddle, your investment is now 7-points.

Even though you have increased your initial investment to 7-points, you have reduced your maximum possible loss to 2-points. With Sato's shares at \$35, the call will be worth 5-points at expiration. Should the shares drop back to \$30, your new put will be worth \$5, reducing your maximum loss on the downside to 2-points. And you have maintained unlimited upside should the stock move strongly in either direction.

If the stock drops to the next lower strike, you can (and probably should) roll call down for a similar result.

10.3.4 Some Cautions

What often happens when an investor purchases a straddle is that the stock will move significantly upwards or downwards, and then just as suddenly reverse direction. This creates the temptation to take a small profit on one side of the straddle, while hoping

the stock will move enough in the opposite direction to take a small profit there as well. However, with straddles, *taking small profits is a poor strategy.* If you are the excitable type, you may find this easier to appreciate in theory than to perform in practice. It can be very distressing for an excitable investor to watch a straddle gain 2 or 3-points only to watch it lose that and more. You enter a long straddle because you think the stock will make a large move in either direction. Unless there is a rational reason to change your opinion, it is in your best interests to exercise discipline.

10.4 Selling a Straddle

Straddles can also be sold, and they are classed as covered or uncovered, depending on whether or not you own enough shares to cover the short call side of the straddle. Both the short put and the short call can cost you big time in a short, uncovered straddle, so this is a risky strategy, is not recommended, and will not be discussed further here.

However, the covered straddle can be a profitable and low-risk strategy. This is particularly appealing to many investors who have already become involved in selling covered calls.

EXAMPLE

Sato's Silvery Flutes is selling at $31 and a September $30 call is selling for 5-points while a September $30 put is selling for 4-points. If you own (or purchase) 100 shares of Sato's, and also sell both the the call and the put, you have a covered strangle.

If Sato's shares close at $30 by expiration, you will make the maximum profit of $800 — $900 worth of gains from the option premiums, less the $100 loss on the sale of the stock at $30/share.

In general, you can calculate the maximum profit from a straddle quite simply:

Maximum Profit = Straddle Premiums + Strike Price - Initial Stock Price

To calculate the break-even point, notice that both arms of the straddle have a break-even of $26. Therefore, the combined position must also have a break-even of $26. Here's a formula:

Break-even = (Stock Price + Strike Price - Straddle Premium)/2

10.4.1 Positions Equivalent to the Short Covered Straddle

In section subsection 7.1.1 it was shown that a short, naked put is equivalent to a covered call. This means that the short covered straddle can be though of in two ways: as a 200-share covered call, or as the sale of two naked puts. In fact, some investors feel that there

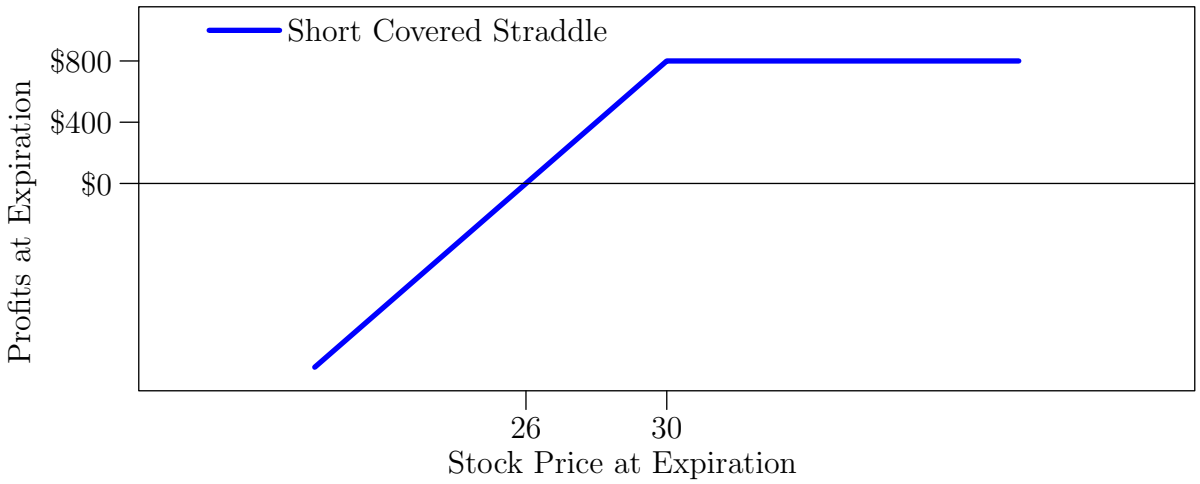

Figure 10.5: Profit graph of a short covered straddle.

is more merit to selling two puts instead of selling a covered straddle. Commission costs and initial investment would be smaller in margin accounts, but it could also be pointed out that leverage isn't always the best policy.

These comments also apply somewhat to the sale of strangles, which were covered earlier.

10.4.2 Comparison of the Short Covered Straddle to the Short Covered Strangle

Obviously, there are many similarities between the short covered straddle and the short covered strangle. Both positions can be viewed as arising naturally from the desire of the covered call seller to increase his profits with the addition of the sale of a put. The strangle would be more usefully employed when the stock is not likely to trade in a narrow range — is more volatile, in other words. The straddle is best if the stock did not move at all by expiration.

But also note the differences: the seller of the strangle *makes their maximum profit over a much wider range of stock prices than the covered straddle seller*. This is because it is almost impossible for both options in a straddle to expire worthless, since they are usually set so close to the current price of the stock. Strangle strikes are usually set over a wider range, and so the maxium profit will occur over a wider range as well.

While this may make the strangle appear more conservative than the straddle, recall that if the stock makes a strong movement in either direction, the strangle writer will have little recourse besides buying back the in-the-money option, which will generally be quite expensive.

10.4.3 I Sold a Covered Straddle, Now What?

If you sold your straddle for prices that would make you happy to sell your stock on a bullish turn, or buy more on a bearish one, then there is little follow-up required. If not, then you will need to take some action.

There is usually very little to be gained from rolling a straddle up or down. If the stock runs up dramatically, and you want to keep your shares, you will probably want to buy back your call. You might consider re-purchasing the call when it reaches the price you were paid for the straddle. For example, if the straddle paid you 7-points, and the call will now cost you 7-points to buy back, perhaps this would be a good time to repurchase the call. The risk here is that the stock could then turn around and make the put more valuable, and you would be stuck with an expensive re-purchase on both sides of your position. Of course, the same strategy can be used if the stock tanks dramatically. The put can be bought back when it reaches the price you were paid for the straddle. This assumes you do not want to purchase the shares.

There is another, somewhat more complex follow-up strategy that has a lot to recommend it. It is best explained by example:

Example

A straddle was sold for 7-points when the underlying stock was at $25. Now the stock is at $50, and the following option prices exist:

September $25 call	7-points
September $25 put	1-point
September $30 call	3-points

As discussed above, you could by back the September $25 call for 7-points, the same amount you were paid for the straddle. If the stock stays above $25, then you have pretty much eliminated any major loss. On the other hand, you have also eliminated any hope of a gain.

Another possibility is to buy the September $30 call for 3-points. This reduces your total profit to 4-points, but now you are completely protected on the upside, no matter how far much the stock price may increase. Should the stock close above $30 at expiration, you will have to buy back the $25 call for 5-points, but this leaves you with a loss of only 1-point. However, if the stock closes between $21 and $29, you will be able to buy the straddle back for less than 4-points, which gives you a profit.

Should the stock continue to climb, you can consider buying back the put for minimal amounts, say 0.5-point. Then should the stock reverse and be anywhere below $28.5, you will keep your 3.5-points of profit.

Alternatively, even if the stock suddenly drops, after the large run-up it will probably take some time to fall back below $25, at which time there will be greatly reduced time value and you can probably buy back the spread for much less than 7-points.

While the above example discusses the case when the stock runs up, a similar strategy works well when the stock goes down, namely buying a put at the next lower strike to limit losses on the downside.

Starting Out Protected

It sometimes makes sense to start a straddle with no risk in one direction. To do this, buy an out-of-the-money call or put at the same time as you enter the straddle. This is the same as the follow-up strategy discussed in the last section, but the protection will cost much less at the start of the straddle, since it is out-of-the-money. You could even protect yourself on both sides by purchasing two out-of-the-money protective options. Whether or not this is wise depends completely on the market prices of the options when you enter the straddle, but it is certainly worth consideration.

10.5 Up to the Minute Summary

- A strangle is a combination of a put and and a call on the same underlying stock. A strangle may be bought or sold.
- You can buy a strangle to lock-in the profits from a long call.
- You can buy a strangle to lock-in the profits from a long put.
- When the unusual situation arises that a stock is more likely to make a large movement up or down than to stay in a narrow trading range, buying a strangle makes sense as an initial position.
- In-the-money strangles cost more, but are the safest.
- If the stock moves up or down, you may use any of the tactics discussed for calls or puts as follow up actions. This can involve you in excessive commissions, so do not do this automatically.
- A covered strangle is a short strangle combined with a long stock position to cover the short call.
- Covered strangles can be used with advantage when a stock is trading in its fair value range, to increase profits, or obtain stock at better prices.
- Follow up actions for covered strangles are particularly important if the stock makes a precipitous drop.
- A straddle is a combination of a put and a call on the same underlying stock, with the same expiration date and strike price.

- Long straddle can make money for you if the stock rises or falls dramatically. You lose your investment if it remains unchanged at expiration.
- The best follow-up actions for a straddle buyers are rolling up the put (if the stock price increases) or rolling down the call (if the stock price decreases).
- It is easy to lose money on straddles by trading to much. Avoid this temptation.
- Selling a straddle is best done *covered*, by owning enough stock to cover the short call arm.
- With a short straddle, you make most of your profits if the stock closes at the strike price of the options on expiration day.
- It is best to sell straddles when you would be happy to part with the stock or buy more at the cost adjusted prices.
- You can buy protective puts or calls when the stock goes down or runs up.
- Consider starting your straddle with protection in place on one or both sides. If it can be done economically, it may be a very good idea.

11 Synthetic Long

Chapter 1 on option basics, chapter 2 on covered calls, chapter 6 on puts and chapter 7 on put selling should probably be read before you tackle this chapter.

Another type of combination using puts and calls are the so-called "synthetics". There are several synthetics, but the ones of most interest to option investors are the synthetic long and the synthetic short. These are equivalent to being either long or short stock, hence the name. Since the synthetic short requires the investor to hold a naked call, it is a particularly risky position and probably not available to most new option investors, so it won't be discussed here.

11.1 The Synthetic Long

When you buy a call and sell a put at the same strike price, you have set up an option position that is equivalent to owning shares of the stock. This is a strongly bullish position, superior to the long call position because the sale of the puts reduces the initial investment for the calls. It is inferior to the long call position because the short puts add substantial risk. The difficulty is the same as the difficulty with any long call position. Precision is required — you must pick the right stock, and it must rise enough before the position expires to make the position profitable.

Example

Shares of Walbaloo Inc. are selling for $30. March $30 calls are selling for 5-points, and the March $30 puts are selling for 4-points. Selling the put and buying the call will cost 1-point: 5 - 4 = 1.

Here is a table comparing the outcome for the synthetic long and the actual purchase of 100 shares of Walbaloo:

Stock Price	$30 Call	$30 Put	Options Total	Stock Purchase Total
20	($500)	($600)	($1,100)	($1,000)
25	(500)	(100)	(600)	(500)
30	(500)	400	(100)	0
35	0	400	400	500
40	500	400	900	1,000

As you can see, the synthetic long tracks the actual long stock position very accurately, with only a $100 difference which represents the amount spent to set up the position.

The reason for preferring the synthetic long over the actual long position is the additional leverage obtained. When the puts are secured with cash, which is the norm for beginners with options, the leverage is less than it would seem. $3,000 will be unavailable for other investments during the life of the puts, so the total net cash investment for the synthetic long is actually $3,100. By comparison, using margin, the requirement is only $1,500, and that is collateral, not cash.

Of course, if the strategy works out, as the stock increases in price the cost of the put will drop significantly, which means that the put could be repurchased early for a very small payment, perhaps as little as $0.10 or $0.20. And the cash is secured, not spent — the only actual expenditure is the $100 debit.

11.1.1 Splitting the Strikes

An even more bullish variation on the synthetic long is known as "splitting the strikes". A lower strike price is used for the put and a higher strike price is used for the call. This can reduce the initial expense, and sometimes even produce a credit. Usually out-of-the-money options are used.

Example

Shares of Walbaloo Inc. are selling for $33. An April $30 put is selling for 2-points and an April $40 call is selling for 1-point. You can sell the put and purchase the call for a net profit of $1, less commissions. If the stock closes between $30 and $40, the options expire worthless but you make a small profit from the sale of the put.

If Walbaloo goes above $40, your profits are unlimited. On the other hand, since you sold an out-of-the-money put, should the shares drop below $30, you are facing substantial losses. Here's a table:

Stock Price	$30 Put	$40 Call	Total
20	($800)	($100)	($900)
25	(300)	(100)	(400)
30	200	(100)	100
35	200	(100)	100
40	200	(100)	100
45	200	400	600
50	200	900	1,100

Investors who find calls too expensive are often tempted by this strategy. Considering the downside risk, the price of the call should not be your only criterion for opening a synthetic long.

A Common and Dangerous Error

Sometimes the investor who is trying to defray the cost of purchasing the calls in a synthetic long will sell an in-the-money put with a *higher* strike price than the call. This will pay enough so that it may completely offset the purchase of the call.

The problem with this strategy is that there is an area of *double leverage*. When the stock is between the strikes, *both the call and the put are in the money, and so you face a double risk of assignment*. Since the put is in the money, it may be exercised against you. And should the call expire in the money, you may be automatically assigned on expiration day. If you try this variation, monitor it carefully prior to expiration. If it looks like both options will finish in the money, buy back the put, and notify your broker that you do not want the call exercised.

11.2 Up to the Minute Summary

- A synthetic long is a long call and a short put on the same underlying. Commonly, both have the same expiration date and strike price.
- Synthetic longs are highly leveraged positions. The short put helps defray the cost of the long call, and reduces the initial investment.
- Compared to owning stock or a long call, there is a greater degree of risk with the synthetic long.
- A common variation is known as "splitting the strikes", where a put with a different strike price is sold. This is done to acquire a bigger premium from the put.
- Avoid selling a put with a higher strike price than the call, which creates an area of "double leverage" between the two strikes.

11.3 Chapter Glossary

Splitting the Strikes Using different strike prices for the calls and puts in a combination. This term is usually used when it is more common to use the same strike for a particular combination.

Synthetic Long Leverage on steroids. A combination of a long call and a short put on the same underlying. Usually the same strike price and expiration date are used for both the call and the put.

12 The Bear Put Spread

Chapter 1 on option basics, chapter 4 on bull call spreads, chapter 6 on puts, chapter 7 on put selling, and chapter 8 buying provide useful background for this chapter.

It is possible to construct bear or bull spreads using either calls or puts. Just as there are advantages to using the upwardly profitable call to create a bull spread, there are advantages to using the downwardly profitable put to create a bear spread.

12.1 The Bear Put Spread

As the name implies, when you open a bear spread, you expect the stock to drop in price. To create a bear put spread, you sell a put at a lower strike and buy a put at a higher strike. This is a debit spread, since the put with the higher strike will be deeper in-the-money and therefore cost more than the put with the lower strike put pays. And since the expiration dates are the same, it's classified as a vertical spread.

The maximum return is limited to the difference between the strikes, less your initial investment. You'll receive this if the stock closes anywhere below the lower strike price at expiration. Your maximum loss is limited to your original investment, which will occur if the stock closes anywhere above the higher strike at expiration.

Example

Shares of McKinnon's Instant Haggis (PUKE) are selling for $25. There is an April $30 put for 2-points, and an April $20 put for 7-points. You buy the $30 put and sell the $20 put for a net debit of 5-points. You will need $2,000 cash in your account to secure the $20 put.

The profit graph for the bear put spread is shown in Figure 12.1, with the specific numbers for the above example attached. Not too surprisingly, it looks like a bull spread graph turned upside down. As you can see, the maximum loss and maximum profit occurs at and below the strikes, with a break-even price of $25. Here are formulas you can use to calculate these important points easily:

Maximum Loss = Initial Investment

Maximum Profit = High Strike - Low Strike - Initial Investment

Break-even price = High Strike - Initial Investment

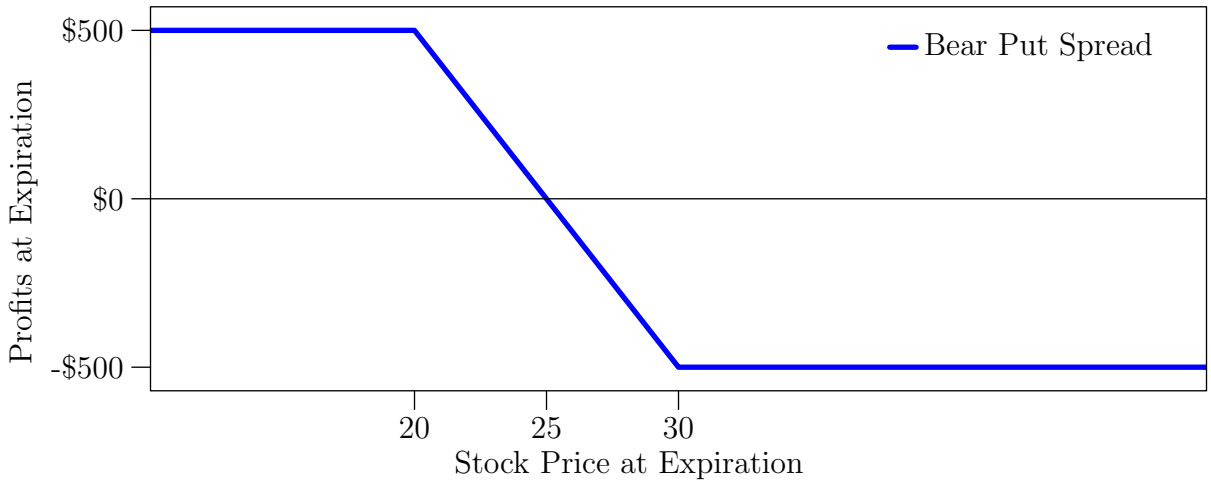

Figure 12.1: Profit graph of bear put spread.

As has been mentioned frequently, puts lose time value faster than calls when they go into-the-money. This has a positive effect on bear put spreads — they widen faster than call spreads. In our current example, if shares of PUKE quickly dropped to $18, the $30 put would be very near 12-points, with almost no time value. But the short $20 put would also have very little time value, probably selling for about 4-points, and widening the spread to 8-points.

12.2 Selecting a Bear Put Spread

An extremely conservative bear put spread could be set up with both puts in-the-money. For example, with a stock trading at $28, you could open a bear put spread with strikes of $35 and $30. As long as the shares stay below $28, you will make your profit. It will be small, but you are very likely to get it. And if the stock climbs above $30, you have less danger of realizing your maximum loss.

At the other extreme, you can set-up the spread so that both legs are out-of-the-money. For example, with a stock at $28, you could buy a $25 put and sell a $20 put. Your stock must drop a full 8-points to make the maximum profit, but if it does, it will be a nice one.

Probably the best balance of risk and reward is to arrange the strikes so the stock is somewhere in the upper-half of the strike range. Right in the middle is fine. This also goes along nicely with the fundamental principle of option investing, which is to sell time value and buy intrinsic value. Using our example stock price of $28 once again, either a spread of $30 and $25, or even one with the strikes at $30 and $20 could be considered.

If you wish to consider the volatility of the stock when you rank your bear spreads, you may find the discussion in section 4.5 to be of interest.

12.3 What do I do With My Brand New Bear Spread?

As with most spreads, very little in the way of follow up action needs to be taken. If the stock moves below the lower strike, you will want to watch the short put to make sure you won't be assigned shares. If you think the decline is going to be severe, you might consider buying back the short put and hanging on to the long put to generate more profits. And since spreads with puts widen fairly quickly (for a spread), you might just close the position early.

12.4 Chapter Glossary

Debit Spread A spread where the short side does not completely pay for the purchase of the long side of the spread. The difference in these two amounts is the net debit that you will pay to open the spread.

12.5 Up to the Minute Summary

- Bear spreads are best entered with put options. You sell a put with a lower strike, and buy a put with a higher strike.
- The maximum return possible is the difference between the strikes, less the initial investment.
- Spreads with puts widen faster than spreads with calls.
- The best balance of risk and reward with a bear put spread is to arrange the strikes so that the stock is roughly in the middle.
- Little followup is required for a bear put spread. If the stock drops below the short put, you should pay attention so you won't be assigned. Should you acquire a profitable spread, you may consider closing early.

13 LEAPS

You should probably read all the previous chapters before this one.

LEAPS[1] are just very long-term options, which expire in years rather than months. There are LEAPS calls, LEAPS puts and they aren't terribly different from the short-term options you have become familiar with. Because leaps are much longer lived, certain factors will be magnified and some strategies may have to be modified.

13.1 LEAPS Pricing

The same factors that influence short-term options also influence LEAPS. As discussed in section 1.2, they are:

1. The relationship of underlying stock price and strike price of LEAP.
2. The time to expiration and volatility.
3. The risk-free interest rate
4. The dividend yield of underlying stock.

While there is no change in the calculation of intrinsic value for LEAPS, the longer lifetime of LEAPS is the cause of significant differences in the effects of the other factors. We will deal with each in turn.

13.1.1 Time to Expiration

Figure 13.1 compares the price curve of options with different expiration dates. Note that over the time-frame shown (3-months), the LEAPS' price curve is nearly straight. Even when it is very out-of-the-money, there is so much time-value in the LEAPS that it is considerably flatter than any of the other curves.

This highlights a possible danger for the buyer of LEAPS calls. If there is a stock selling for $25, and you buy a 2-year LEAPS with a strike price of $30 for 10-points, the stock must reach $40 by the expiration date of the LEAPS in order for you to just break-even on your call purchase! This is a change of 60% in the stock price. There are very few stocks which increase that much even over two-years. The presence of so much time-value in LEAPs is something that must be taken into account when using them.

[1] It stands for "Long-term Equity AnticiPation Securities".

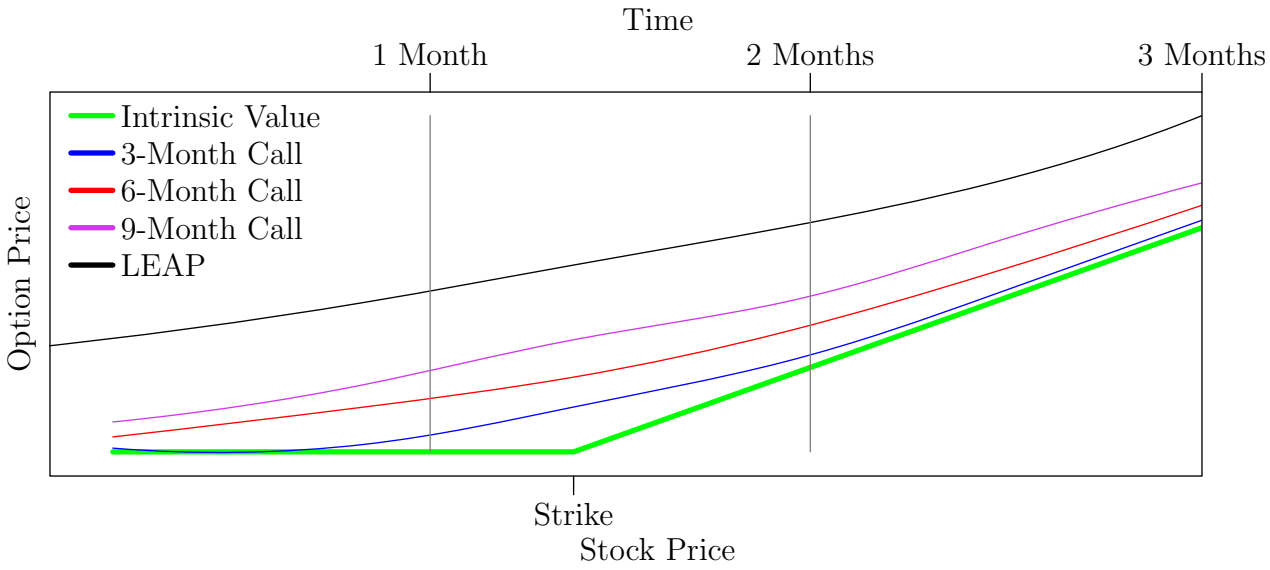

Figure 13.1: Comparison of options with different lives with a LEAP.

13.1.2 Effect of Volatility

Volatility also has a stronger effect on LEAPS than on short-term options. Table 13.1 gives the increase in option prices for an increase of 1% increase in volatility for a 3-month call and a 2-year LEAPS call.

Considering that market volatility can change by as much as 50% in the space of a single month, volatility becomes a very significant factor in LEAPS option pricing.

	Out-of-the-money	At-the-money	In-the-money
Three Month	0.3	0.21	0.4
Two Year Leap	0.43	0.48	0.33

Table 13.1: Comparison of the effect of volatility on LEAPS vs. short-term calls.

13.1.3 Effect of Interest Rate

The effect of interest rates on short-term options is so small that it was not worth discussing. This is not true for LEAPS.

Figure 13.2 shows the effect of rising interest rates on the LEAPS' premiums. For out-of-the-money LEAPS, the difference is quite large — almost an entire point. And when the LEAPS are in-the-money, the effect is dramatic. A change of 3% in interest rates causes the price of the at-the-money LEAPS to increase by over 2-points. And surprisingly, premiums of in-the-money LEAPS increase even more. This is a huge effect.

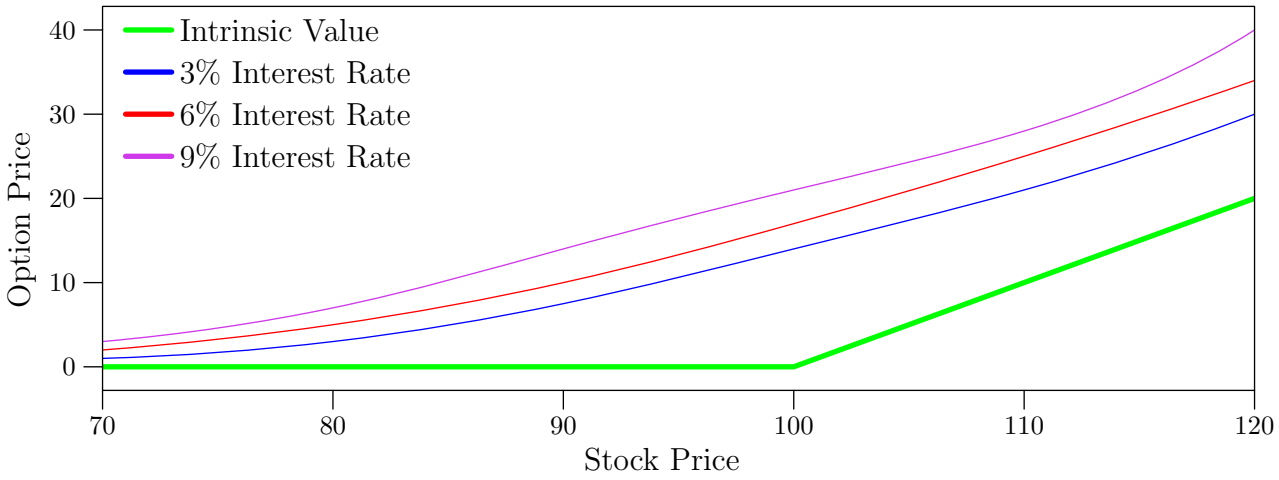

Figure 13.2: Effect of interest rates on LEAPS.

13.1.4 Effect of Dividends

Recall that dividends reduce the premiums of short-term calls. Figure 13.3 shows a similar effect on LEAPS. However, the reduction of premiums due to dividends is less than the increase due to rising interest rates.

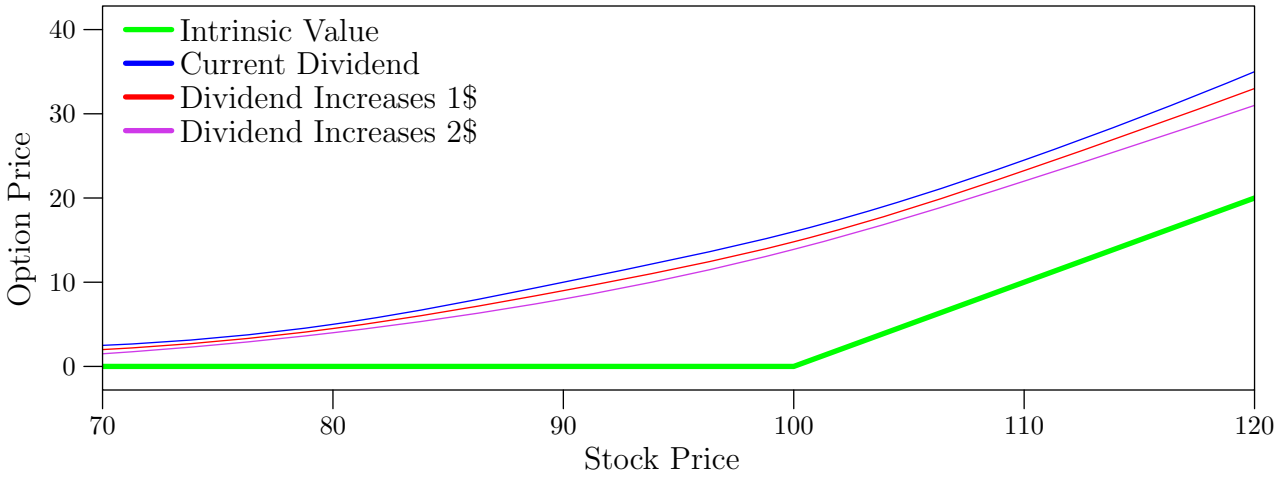

Figure 13.3: Effect of dividend increases on LEAPS calls.

LEAPS puts have a premium increase, just as with the short-term puts. The life of the LEAPS shown is two-years — LEAPS with less time to expiry would naturally experience a reduced impact from dividends.

The large effect of dividend increases on LEAPS is logical. A 3-month call would be affected by only one ex-dividend. A two-year LEAPS would have eight ex-dividend periods.

If the dividend increased by $0.25 every quarter, a three month call would see a premium reduction of perhaps $0.14. But the two-year call might see a reduction of as much as $1.50.

13.2 USING LEAPS

LEAPS may be used in any strategy, with little or no modification. However, failure to consider the important effects that time value, interest rates and dividend payments have on LEAPS may give you an unpleasant surprise.

While not the only considerations, the data on interest rates and volatility suggests that you should be inclined to purchase LEAPS when interest rates and volatilities are low. When interest rates and volatilities are high, your inclination should be to sell LEAPS. You will be living with your LEAPS for a long time, it makes sense to position yourself as favorably as possible when you open a position.

13.2.1 Buying LEAPS Instead of Stock

When using LEAPS for a long term holding instead of stock, one possible strategy is to take the money saved and invest it in something "safe", such as a treasury or an interest bearing account.

For purposes of illustrating the idea, we will assume that you are considering buying 100 shares of Xaio Mei Enterprises at $40 a share. You see that there are 1-year LEAPS with a strike price of $30 that are selling for 12-points. Xaio Mei Enterprises pays an annual dividend of $0.50, and short term interest rate is 3%.

First calculate the difference in investment required for the stock vs. the LEAPS

Stock	
100 shares @ $40:	$4,000
Plus Commissions:	$9
Net Stock Costs:	$4,009
LEAP	
1 @ $12:	$1,200
Plus Commissions:	$10
Net LEAPS Costs:	$1,210
Subtract LEAPS Costs from Stock Costs:	
Net Difference:	$2,799

We want to calculate the costs and the savings of each position. An investment in an option involves paying for time that will disappear over the course of a year. If we invest in options, we won't be receiving dividends. In compensation, we receive interest on the $2,799 we saved:

Costs	
Time Value Cost	($200)
Net Dividends Lost	($50)
Savings:	
Interest on $2,799 @ 3%:	$84
Net Costs:	($166)

It may be more meaningful to express this as a per-share figure. Your costs of investing in a LEAPS vs. Stock are $1.66 per share. With the LEAP, you enjoy all the appreciation of the stock (except for $1.66 worth), but have risk only down to $2,799 + $84 = $2,883 or $28.83 per share (assuming you do put the money somewhere that will bring you $84 dollars, of course).

It would seem that using a LEAPS in this particular situation is an excellent idea. You can also take that money and invest it elsewhere, such as other option plays or in stock. However, the results of doing this are impossible to quantify.

13.3 Using LEAPS Puts as Insurance

This was discussed in chapter 9 using short-term puts. If you have long-term holdings and like the idea of insurance, LEAPS puts have much to recommend them. Carefully calculate all the cash inflows you expect from the stock, such as dividends, or special dividends, and consider how the purchase of the LEAPS impact your returns.

13.4 Using LEAPS Puts Instead of Shorting

This was discussed for the short-term case in chapter 8. Doing this with LEAPS has the same advantages discussed there: limited risk and no need to make dividend payouts. There is little to be done to decide if it is better to use LEAPS instead of actually shorting the stock. If the time value premium purchased with the put is small in comparison with the dividend payout that you would save from shorting, then the put is unquestionably the better choice.

Incidentally, this is one of the few areas where the small investor has a slight advantage over exchange traders. Exchange members receive interest on their short sales, so for them to use puts, it would require a time premium of zero for it to make it worthwhile.

13.5 LEAPS Selection

As discussed, opening a long or short position with a LEAPS call or put purchase instead of stock can be advantageous. As always in investing, there are disadvantages — you risk the loss of 100% of your investment, and time decay works against you with LEAPS just as it does with shorter term options. It just takes longer.

LEAPS expose you to less risk of time decay on a day-by-day basis. But the LEAPS will eventually become short-term options. When that happens, just as with short-term options, the rate of time decay as expiration draws near will increase. But at the beginning of the LEAPS life, that is far in the future.

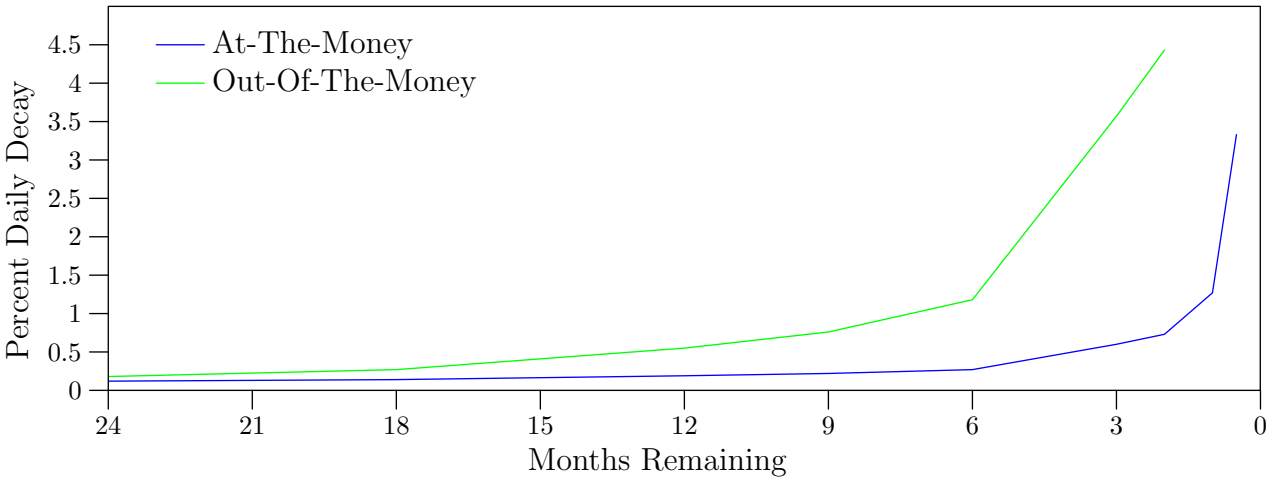

Figure 13.4: Comparing the time decay of an at-the-money 2-year LEAPS call with an out-of-the-money 2-year LEAPS call.

Figure 13.4 shows the rate of decay of two options. The vertical axis shows the percent of an options price that is lost daily due to time-decay – the higher the line, the more time-decay gets rubbed off of your options value. At 9-months away from expiration, the options still qualify as leaps. After that, they become ordinary options.

Notice that out-of-the-money LEAPS decay considerably more than in-the-money LEAPS. This is still much less than the time decay of short-term options. For most of their lives, out-of-the-money LEAPS lose less than 0.3% of their value each day. This is a microscopic amount compared to the 1% per day lost by a 6-month, out-of-the-money option. And the short-term option loses that with 6-months still remaining to expiration!

This slow rate of decay is a great advantage, both psychologically and strategically. Your timing of the option purchase does not have to be as precise as it does with short-term option buying. If you feel the stock will move in your favor, LEAPS give you the luxury of time. And if the stock does not move as you hope, even giving the stock 6-months to play out, you still be able to recover a reasonable portion of your investment, thanks to the slow rate of decay.

Even little dabs of lost time add up however. An at-the-money LEAP call will decay by about 0.125% per week. Assuming no change in stock price, this means that in six months it will have lost 25% of its original value. While vastly better than short-term options, which lose 25% of their value in four to five weeks, a 25% loss remains a significant one.

Looking again at Figure 13.4, you can see that the decay curve starts to move up around the 6-month mark. If you have an at-the-money LEAPS whose underlying has refused to

budge, that would be a good time to make a decision. If you still believe in the stock, then this would be a good time to roll the call into another 2-year LEAP. Otherwise you can exit the position.

The out-of-the-money call is more extreme. It begins to decay more rapidly a bit before the end of its first year of life. But the same logic applies here as with the at-the-money option. When the rate of time decay begins to increase, consider liquidation or a roll.

13.5.1 Increasing Volatility and Interest Rates are Your Friends

As a LEAPS buyer, you should be happy to hear that interest rates are moving up and volatility is increasing. This can improve the situation for you even if the underlying has refused to budge. If the stock is moving the way you want, then so much the better for you when rising interest rates and increased volatility lend a hand.

Historically, interest rates, when they have risen, have increased as much as 0.4% a month (3% in 6 months). It would take about a 6% rise in six-months to maintain the price of a LEAPS call whose underlying remained unchanged. So interest rate increases alone are not enough to help you.

However, it is quite possible for volatility to increase as much as 50% from its previous level in a single month, and certainly in 6 months. To keep your LEAPS call at its opening price for 6-months despite an uncooperative underlying, volatility would only have to increase by 20%. If it increased by 50%, the price of your call would actually go up, even though the stock had not changed at all.

Of course, if you are a call seller, the shoe is on the other foot. The last thing you want to see are increased volatility and interest rates. This is why it is always a good idea to be aware of the general rates of volatility and interest rates before using LEAPS.

13.5.2 LEAPS and the DELTA

The delta of calls was introduced in subsection 3.4.1, put deltas were covered in subsection 8.2.1. Recall that the delta is the amount that the option price changes for every point of change in the underlying. There are some significant differences between the deltas of short-term calls and LEAPS deltas.

Delta's of at-the-money LEAPS tends to be quite large, around 0.70. Very short-term at-the-money options have deltas of about 0.50, while slightly longer-term ones have deltas as high as 0.60. In general, the longer the life of an at-the-money option, the higher its delta will be.

As a general rule, in-the-money and out-of-the-money LEAPS will move more in line with the stock than short-term options will. This will change only if both the short-term option and the LEAPS option are more than 5% in the money.

The delta of the 2-year LEAPS option does not change very much when the stock moves, while the delta of a comparable 3-month option will change dramatically as it moves from out-of-the-money to in-the-money. This means the amount the LEAPS can be expected to

change is rather stable. With short-term options, you expect the in-the-money call to move more in-line with the stock, which makes them worthwhile purchases. With LEAPS, there is much less difference in the amount of price movement that will occur. The delta of an in-the-money LEAPS call might differ from the delta of an out-of-the-money LEAPS call by as little as 0.25. Since the out-of-the-money LEAPS call would probably be cheaper, there may be little reason in this case to pay more for the in-the-money option.

Most of the above applies to puts deltas. Because of the interesting relationship mentioned earlier:

1 = Delta of Call - Delta of Put

the relationships discussed above are inverted. In other words, while a short-term calls price moves more slowly than a LEAPS call, the short-term puts price moves faster than the LEAPS.

Out-of-the-money LEAPS and short-term puts don't behave very differently from each other, but the in-the-money puts move quicker if they are short-term. The deltas of LEAPS puts are not very large. For example, a 2-year LEAPS put typically has a delta of only 0.30. This has important implications for those who are considering using LEAPS puts as a short position on stock. The leverage factor here is not great — it takes about a 3-point move by the underlying for an at-the-money LEAPS put to increase by one point. In short: Long-term puts don't mirror the stock movement anywhere near as well as short term puts do.

13.6 LEAPS Selling

The strategies involved in selling LEAPS do not differ very much from those discussed for shorter term options. The main difference is that due to the slow rate of time decay, option sellers who enjoy watching their options time value decay will not have this pleasure with LEAPS. This has a bearing on follow-up actions. Most follow-up actions for the selling strategies depend on being able to buy back the sold option when it has little or no time value left. This won't work very well with LEAPS, because LEAPS hold on to their time value quite strongly even when deeply in or out-of-the-money. Be aware that you may end up repurchasing substantial amounts of time if you sell LEAPS.

The large premiums that LEAPS pay are enticing, but this can be deceptive. If you calculate the returns carefully, you may find that you end up with better profits if you stick with the short-term options.

In the sections that follow, we will examine the use of LEAPS in several of the strategies covered earlier for short-term calls.

13.6.1 Covered Call Writing

EXAMPLE

Shares of McKinnon's Instant Haggis are selling for $30. You are considering a 500-share covered call position, and are being tempted by the 2-year LEAPS with their luscious premiums. The January $50 LEAPS sell for 8.5-points and have two years before expiration. On the other hand, there is a 6-month July $50 call which sells for 4-points. McKinnon's pays a dividend of $0.25 each quarter.

To decide which is better, you have to do the math.

	July $30	January $30 LEAP
Stock cost (500 share @ 30)	$15,000	$15,000
Plus Stock Commissions	9	9
Less Premiums Received	(2,000)	(4,250)
Plus Option Commissions	15	15
Net investment	$13,025	$ 10,774

For simplicity, we will assume the stock stays above the strike price so the return if unchanged will be the same as the return if exercised. Recall from subsection 2.6.4 that the return if unchanged is the preferred metric for evaluating covered calls. Note that the LEAPS seller gets to collect more dividends - eight of them in two years.

	July $30	January $30 LEAP
Stock Sale (500 @ 30)	$15,000	$15,000
Less Stock Commission	9	9
Plus dividends earned	250	1,000
Less net investment	13,025	10,774
Profit if unchanged	$2,235	$5,235
Return if unchanged	17%	48%
Annualized Return	34%	24%

To get the big picture, we must also calculate the downside break-even:

	July $30	January $30 LEAP
Net investment	$13,025.00	$ 10,774.00
Less Dividends Received	(250.00)	(1,000.00)
Total Stock Cost at Expiration	$12,774.00	$9,774.00
Divided by shares held	500.	500.
Break-even price/share	25.55	19.55

To compare the two returns, we must annualize them. We multiply the 6-month return by 2, and divide the 2-year return by 2 to get the equivalent yearly returns. The annualized return for the 6-month call is 34%, and the annualized return for the LEAPS is 24%.

Clearly, on an annualized basis, the short-term call is the better choice. But the situation remains murky. To make 34% a year for two years, you need to repeat your achievement three more times. This may not be likely. How likely it is that your short-term calls will bring you 34% annualized only you can decide. It is certainly very difficult to predict.

You must also be comfortable holding shares of McKinnon's Instant Haggis for two years. If you are becoming uneasy about PUKE's price, or the conditions of the Haggis market, you might want the flexibility to exit your position completely in less than two years time. Perhaps you are worried that Chinese Haggis exports will do better than McKinnon's. In this case, the short-term calls are the better choice.

Downside protection is something that must also be considered. If you use the LEAPS and the shares closed above $19.55 at expiration, you would at least break-even on your investment. But LEAPS introduce a small wrinkle that must be considered. Should PUKE fall quickly to $20 shortly after you purchased the LEAP, there would still be considerable time value left. If you then attempt to recover your costs by closing the position, you would have a loss. This can happen even if the shares are above their break-even point. Remember that the break-even points are calculated assuming you are at expiration — the LEAPS will have a higher price at all times prior to expiration. In some cases, considerably higher.

Rolling down is always problematical, and even more so with LEAPS. While you will continue to bring in large premiums by rolling down, you also reduce your maximum profit potential for a much longer time. You may not wish to roll from LEAPS to LEAPS, but to a shorter term call instead. Doing this may involve you in a large debit transaction.

13.7 Selling Uncovered Leaps

Selling naked short-term puts was described in chapter 7. The almost insurmountable problem with selling LEAPS puts for beginners is the cash security requirement. This has the potential to tie up a substantial amount of cash for a very long period of time, and it is difficult to justify this economically. If you are allowed to use margin to secure the puts, you are in a much better position to sell naked LEAPS puts.

13.8 Early Assignment With Leaps

Any LEAPS option can be exercised any time it is in-the-money. As with short-term options, the best clue as to whether early assignment may occur is to see if there is any time premium left in the option. If the LEAPS is trading at parity or even a discount to parity, then assignment may be near. This is generally unlikely, but it does occur. The reason for the LEAPS selling at parity has to do with the actions of arbitragers. The

arbitrage is complicated, but you don't need to understand it. All you need to do is to pay attention to the time premium of your call. If it disappears, you should take action if you don't wish to be assigned.

13.9 Spreads Using Leaps

Any of the spreads discussed earlier can be done with LEAPS. Diagonalized spreads, where you buy a longer-term option and repeatedly sell short-term ones are particularly well suited to having a LEAPS arm. It is very useful to own the option that is resistant to time decay, while selling the options that are subject to time decay. A risk that using LEAPS bring to the position is that since LEAPS are long term, they are also expensive. This increases your risks — the losses may be substantial if the stock underperforms.

13.9.1 Diagonalized Bull Call Spread

Example

Xiao Mai's Nursing Supplies is currently selling for $75. There are the following calls:

May $70 Call	10.50
May $80 Call	5.50
January $70 2-year LEAPS call	26.00
January $80 2-year LEAPS call	21.50

There are several possible spreads here:

Near-term Bull Spread	Buy May $70	10.50
	Sell May $80	5.50
	Cost:	$500.00
Diagonal Bull Spread	Buy January $70 LEAPS	26.00
	Sell May $80 Call	5.50
	Cost:	$2,050.00
LEAPS Bull Spread	Buy January $70 LEAPS	26.00
	Sell January $80 LEAPS	21.50
	Cost:	$450.00

Because the cost of the LEAPS spread is close to that of the near-term bull spread, they should have about the same profit potential at their individual expiration dates.

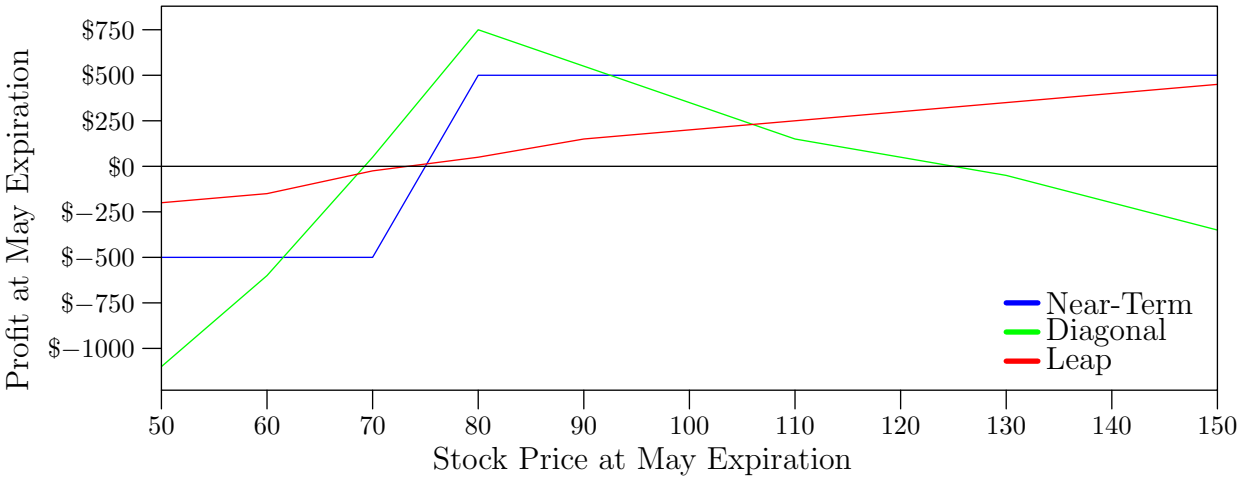

Figure 13.5: Comparing near-term, diagonal and long-term LEAPS spreads.

The profit graph of all the spreads at the near-term May calls expiration is shown in Figure 13.5. The near-term bull spread has the very familiar profit graph we first met in chapter 4 ((Figure 4.4). The maximum profit occurs anywhere over a share price of $80 and the maximum loss anywhere below $70.

The LEAPS spread hasn't done much in the 3-months that have passed. Even if the stock rises to $90, the LEAPS spread will have only a $150 profit. On the good side, if the shares should drop to $50, the spread will lose only about $200. This is very typical behavior for long-term bull spreads when both options still have plenty of time premium left.

One glance at the graph will show you that the diagonal spread is a spread of a different color. The profit graph shows that this is by far the most bullish of the three possibilities. As with any spread, it makes its maximum profit at the strike of the short option. Notice also that once this maximum profit point is reached, if the stock trends higher, the diagonal spread begins to lose money, and can even begin trading at a loss if the stock really takes off.

The diagonal also has the greatest dollar risk (not percentage risk), because it also has the largest initial investment. If the shares fall to $50 by May, the diagonal will lose about $1,100, or nearly 50% of the initial investment.

The diagonal will pay more than the others when the underlying is near the strike of the short call. If it moves a lot — in either direction — the diagonal spread is the worst of the three possibilities. This illustrates that *the diagonal spread is a neutral spread. Selection of the proper underlying is crucial to the success of the diagonal bull spread. Slow, stable and steady growers are the best candidates for this strategy.*

The deltas of the options can be used to predict how it is going to perform. A short-term, in-the-money option will have a rather high delta, especially as expiration approaches. On the other hand, an in-the-money LEAPS call will not have a particularly high delta, because

of the huge amount of time value remaining. If you are short an option with a high delta, and long an option with a smaller delta, you will lose money if the underlying stock rises. For the present example, given a LEAPS with a delta of 0.60, and a short call with a delta of 0.90, should the underlying rise by one point, the spread will lose 30 cents, since the delta of the short option is 0.30 greater than the delta of the long option.

A diagonal spread can actually lose money when the stock outperforms. This is especially true when the long arm of the spread is a LEAP. This may be hard to believe, but the graph makes it clear. Do not forget that this is a distinct possibility. It is not easy to fix this problem by fiddling with the options. You can try to widen the strike prices so that there is some profit potential remaining even if the stock has a dramatic rise, but that can be difficult to do and still get a decent price for the short call. This is something that is best dealt with before the spread is initiated, with the proper selection of the stock to begin with.

There are other dangers with the diagonal. If, instead of going up, the stock goes down, you may be inclined to roll down the short call. If the stock continues to drop, you may reach the point where you would end up with the short call's strike *below* the LEAPS. Aside from the fact that this would involve you in a naked call and your broker might not let you do it, even if you were allowed to, this would also involve you in a locked-in loss.

I write so much about the dangers of the diagonal mainly because so many other writers consider diagonals with a long LEAPS arm to be "free money". This is not the case. However, in practice, with the proper selection of the underlying stock, this can be an extremely successful strategy and it is a favorite of mine. While even stable companies can have sudden spurts in their stock price, the spurts are typically short-lived, and can be easily dealt with by rolling the short call up. In my experience, losses with a diagonal spread have been extremely rare.

13.10 Up To The Minute Summary

- LEAPS are very long term options. Other than their longer life, they are the same as the short-term options.
- Factors which are negligible in short-term options pricing become significant for LEAPS. These are:
  1. Volatility.
  2. The risk-free interest rate.
  3. The dividend yield of the underlying.
- As the risk-free interest rate increases, the price of the option will also increase. The increase is large over a 2-year period.
- If dividends increase, the premiums of LEAPS calls will go down, while the premiums of LEAPS puts will go up.

- Volatility has a very large effect on LEAPS option pricing.
- LEAPS can be used in any strategy that short-term options are used. The increased time value and the effects of interest rates, volatility and dividends can cause some surprising results.
- If interest rates and volatility are low, it is a good time to buy LEAPS.
- If interest rates and volatility are high, it is a good time to sell LEAPS.
- LEAPS puts as insurance has a lot to recommend it.
- Selling LEAPS puts instead of shorting shares is not recommended, because of the cash security required.
- The rate of decay of an at-the-money LEAPS is very slight until the last 6-months.
- The rate of decay of an out-of-the-money LEAPS is very slight until its final year.
- Deltas of at-the-money LEAPS are very large.
- In-the-money and out-of-the-money LEAPS move more in line with the stock than short-term options.
- They are more stabile, since the delta does not change much when moving from out-of-the-money to in-the-money.
- Calculate the differences between a position with LEAPS and the same position with short-term options before making your decision.
- Also consider the time frame of the investment. If it involves holding stock, make sure you will be comfortable with that over the life of the LEAP.
- Downside protection provided by a LEAPS is poor in the early days of its life.
- You anticipate early assignment with LEAPS the same way as with short-term options. If the LEAPS is trading at or below parity, it is likely to be exercised soon.

14 Option Pricing Models

You should probably read all the previous chapters before this one.

Option pricing models are mathematical equations which attempt to predict the future price of an option based on inputs available (or guessable) today. The mathematics behind such models is forbidding, but don't worry — I'll be gentle. And you don't really need to understand the mathematics. Most people don't know how computers and television sets work, but are still able to use them. It's the same with mathematical models. What you do need to understand are the uses and limitations of your computer, television, or mathematical model.

In this chapter we will examine the **Black-Scholes model**, which is the best known and most commonly used pricing-model for options. It was first presented by Myron Black and Fischer Scholes in 1973, at the dawn of the options market in the U.S. They received the Nobel prize for this in 1997. There is some dispute about the originality of their work, because a largely similar model was developed in 1908 by the Italian mathematician, Vinzenz Bronzin.

14.1 Volatility and Probability

Like most people, you probably have an intuitive understanding of **volatility**. You understand that it comes and goes, and that when markets are volatile, prices move greater distances and with greater frequency. The wild gyrations of a volatile marketplace may be random, but random motions of a large number of objects can sometimes form common patterns.

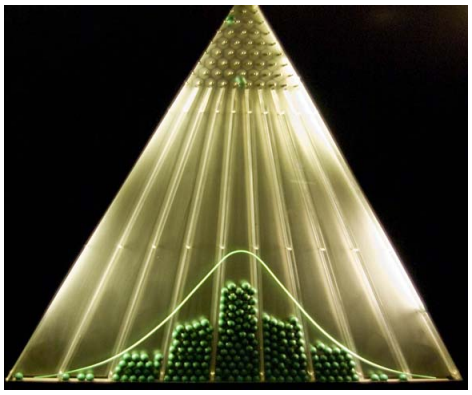

Figure 14.1: A Galton Machine.

Figure 14.1 is a picture of a "Galton Machine", a famous experiment that every first-year statistics student has seen. It's a simple machine, and you can make one at home, whiling away many a pleasant hour in solitary contemplation of randomness.

To use it, you drop balls onto the pins at the upper center of the device. When the ball hits a pin, there is an equal probability (50/50) of the ball moving to the left or to the right. While a few balls make it all the way to either side of the device, most tend to accumulate in the middle, and form the classic bell-shaped curve shown in the diagram. The way the balls distribute themselves is called "the normal distribution" by statisticians, and is found frequently in natural phenomena.[1] The shape of the graph isn't too surprising — most of the balls will end up close to the point they started at. As you move farther towards the left or right of the device, there will be fewer and fewer balls.

By changing the arrangement of the pins, you can alter the "volatility" of the balls. If you increase the volatility, more of the balls will make the distant journey to either end. If you decrease the volatility, more will cluster at the center. You can see this in figure 14.2. For the highest volatility curve (blue line), the "tails" of the curve are much fatter, to accommodate the additional number of balls that have accumulated there. Since more of the ball population has now migrated to the edges, there are fewer at the center of the graph so it must be lower. The situation is the opposite with the low volatility graph — most of the balls have clustered around the center, pushing the peak of the "bell" much higher.

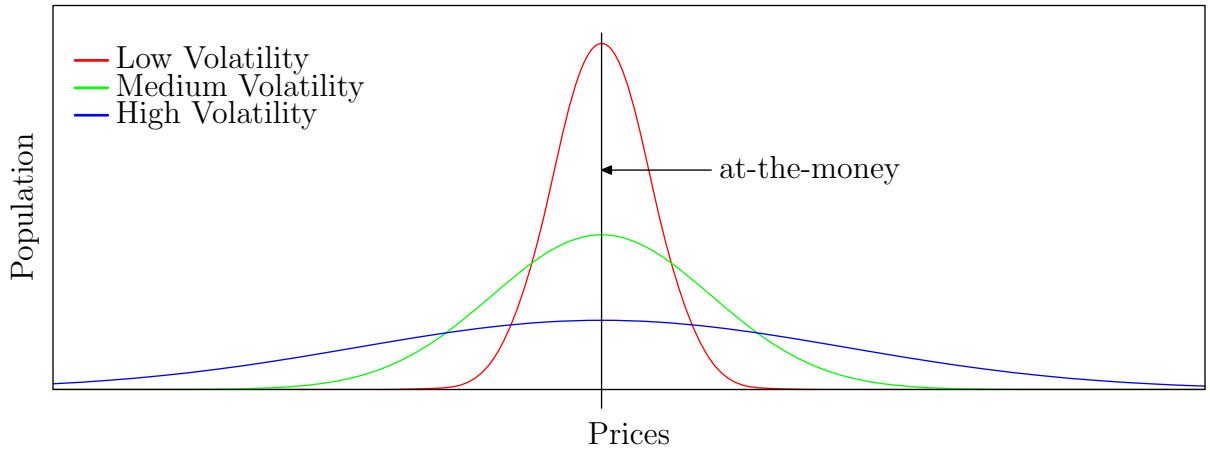

Figure 14.2: Comparing Volatility Distributions.

To convert balls to options, imagine stock options being sprinkled on their underlying, which is right at the center of the bell. They are then buffeted by various market forces, investor sentiment, and who knows what, and eventually settle to the bottom of the graph.

[1] Sir Francis Galton was quite an interesting man. A distant cousin of Charles Darwin, he made significant contributions in many areas. He coined the phrase "nature versus nurture", did the first research in classifying fingerprints, studied meteorology and was also the founder of the eugenics movement.

You might think that since the graph is so symmetrical, the increase of volatility would have no effect on an option's price. After all, increased volatility makes a large upward movement more likely, but it also makes a large downward move more likely. But there is an important difference between options and their underlying stocks. Only options which are in-the-money will have any value — their loss is limited. So for example, if you are sprinkling calls on the underlying, all of the ones left of the at-the-money line will be worthless at expiration. Only the ones on the right will be worth anything. The value of the stock depends on where the peak of the curve is located, while the value of its options depends on how far the curve spreads out.

14.1.1 The Mean and the Standard Deviation

Any normal distribution is completely defined by two numbers, the **mean** and **the standard deviation**. If you know these two numbers, then you know all you need to know about the distribution.

The **mean** of a distribution will always be the highest point of the curve — it's just another word for 'average', and it shouldn't be surprising that most of the stock option 'balls' end up there. The Black-Scholes model works, in part, by making the stock-price the mean of a distribution.

The **standard deviation** is less familiar, but not difficult to calculate. I won't give the formula here (it's in any statistics text), because it's much more important to understand how it affects you as an investor than it is to learn how to compute it. It is essentially a measure of how "spread out" your population is.

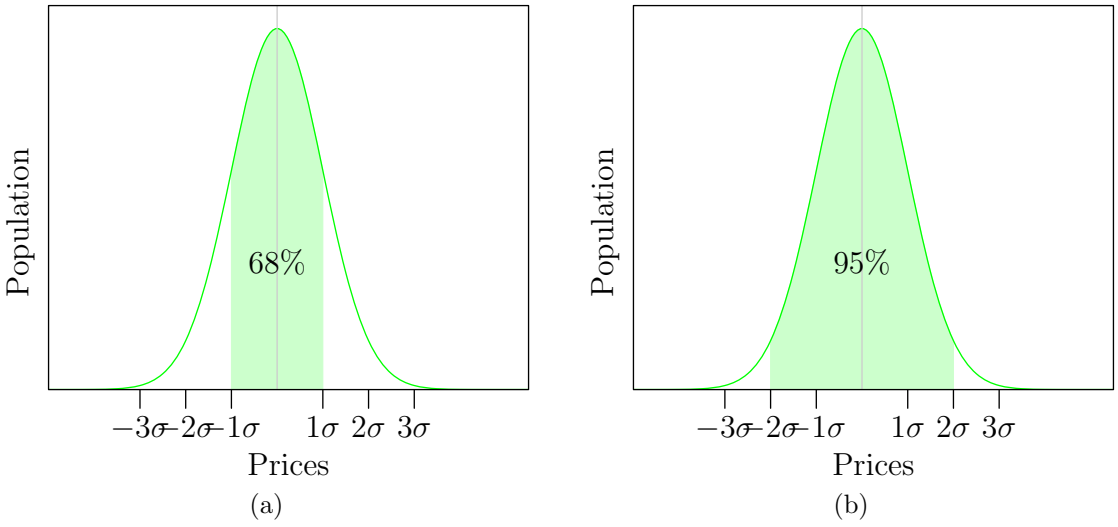

Figure 14.3: (a) 65% of all events occur between the first standard deviations. (b) 95% of all events occur between the second standard deviations.

Figure 14.3(a) and 14.3(b) show the medium volatility curve with the standard deviations marked off, and "probability population" highlighted. The standard deviations are labeled with their usual symbol, σ (pronounced "sigma"). The standard deviation not only tells you how far the distribution will spread out, it also tells you how likely it is something will end up where. The precise number can be calculated, but for all normal distributions:

± 1 Standard deviation contains about 2/3'rds (68.3%) of all the possible occurances.

± 2 Standard deviations contains about 19/20 (95.4%) of all possible occurances.

± 3 Standard deviations contains about 369/370 (99.7%) of all possible occurances.

The mean of this distribution is eight — this just means if you add up all the occurances, and divide by the number of total occurances, you end up with eight. The standard deviation is three.

How much would you have to be paid on a bet that one of your options would end up deep-in-the-money — somewhere past two standard deviations away from the mean? Let's say if that happens, you would make $30 for every $1 you spent. Would it be worth the investment? In this distribution, two standard deviations away from the mean is 6. Since the probability of getting a "hit" within two standard deviations is 19/20, the probability of getting one outside of this area is 1 in 20. But remember that this one chance in twenty includes *both* ends of the curve. So half of the time your option ended up past two standard deviations away it would be *out-of-the-money*. So your option's chance of ending up deep-in-the-money is 1/2 of 1/20, or one chance in forty. Having a pay-off which is less than your risk is not a very good bet to make.

Because the normal distribution is so common, it has been deeply studied for a very long time. As a result, formulas have been developed which make it possible to compute the probabilities associated with every point along a normal distribution curve, as well as the area under various portions of the curve. The Black-Scholes model makes the assumption that the prices of a stock are normally distributed, and uses this distribution to solve for an option's theoretical value, by multiplying each one of a possibly infinite outcomes by its associated probability.

The actual distribution used by the Black-Scholes model is a **lognormal distribution**. It is very similar to the normal distribution, but has fatter tails. One of the principle reasons it was adopted is because the normal distribution allows for the possibility of negative prices — an impossibility in the real world.

14.2 The Black-Scholes Model

Having given you some of the background behind the model, let's take a look at the real thing using call options. At its heart, Black-Scholes calculates the value of a call option as follows:

Stock Price times the probability of the option ending up in-the-money.
Less the present value of the exercise price paid at expiration.

That seems easy enough. I'd give the equation here, but I don't want to frighten you away. I'll save that for the very end. You don't really need to know it. What you do need to know about Black-Scholes is that in order to work, it relies on you to give it the reliable inputs. If you feed it garbage, it will cheerfully give you garbage back.

The original Black-Scholes model needs six inputs in order to predict the price of an option. Here they are:

- The Stock Price (p).
- The Strike Price (s).
- The Risk-free rate (r).
- The Time to Expiration (t).
- The Volatility (σ).

Does this look familiar? It should — these are the same factors we identified in section 1.2 as the most influential on an options premium. The only one missing is the effect of dividends. This is a blemish of the model (and not its only one), but there is an adjustment you can make that helps with this. We'll deal with that later.

The model expects the time to expiration to be entered as a fraction of a year. This is easy and most software will compute the fraction for you given the correct date. The risk-free rate is a little tougher. It should be adjusted to the time-frame of your investment. If you have a 6-month call, the appropriate rate to use is probably the 6-month treasury rate. If you have a 2-year LEAP, then you would use the current rate of the 2-year treasuries. You can find these from free online data services such as Bloomberg.

The really tricky one is the volatility. Options aren't issued with little stickers that say: "Volatility: 30%, guaranteed or your money back." One approach is to use the "historical volatility", which makes the dubious assumption that the volatility of yesterday will be the volatility of today. You can try to "forecast" volatility. This takes the dubious assumptions of historical volatility, and "improves" it by making a guestimate of the future. Good luck with that.

You can also give the Black-Scholes model the current price of an option, the current stock price, the current risk-free rate, and so on, and ask it to tell you what volatility would make all of this possible. This is called **implied volatility**, and is probably the most common approach.[2] This is probably the most common approach, and we'll give an example of how to do this in the very next section.

[2]Some people think this is using the wrong number in the wrong equation to get the right answer. People are very conflicted about Black-Scholes.

14.3 Practical Example: Early Exercise of Put

One thing that is often a concern to investors who have a short put is early assignment. Perhaps the short put is part of a spread that they hope will be profitable, and they aren't really interested in owning shares of the stock. Or perhaps they sold the put for income, and now the put is in-the-money. If you're in a situation like this, you can use Black-Scholes to estimate what the price of the the stock will be when you might need to take action.

The first thing you'll need is a Black-Scholes calculator. If you can run the gnumeric spreadsheet, which is free and really good, this problem is easy to solve. I've provided one here:

http://www.ssr.com/sdb/BAILOUT/Spreadsheets/Black-Scholes.gnumeric

It should also work in Excel. Open it up, and let's get started.

Make your edits in the light-green cells in the input section. You can change the headings (Option 1, Option 2, etc.) to something more descriptive if you want.

In the "Inputs" section, go to the "Puts" sub-section, and make the following entries:

Put Option	Put 1
Data Entry Date	March 20, 2010
Expiration Date	March 4, 2012
Stock Price	10.24
Strike Price	12.50
Risk-free Rate	0.85%
Volatility	

A word about the "Data Entry Date" — this should be the date that the Stock Price and Risk-free Rate are valid on. It defaults to the current date — that will be wrong for this exercise, so just type over it with the date given above. Since this is obviously a 2-year LEAP, we used the current rate paid by 2-year treasuries, which is 0.85%. Make sure you type either 0.0085 or 0.85%, so the spreadsheet doesn't use the wrong value.

Now we need to decide what to do about volatility. Since we don't know what it is, we will hold these inputs steady, give the spreadsheet a 'target' price for the option, and ask it to tell us what volatilty would get us to this set of inputs. To do this, we will need the current price of the option, so looking at your brokers quote screen, you see:

Symbol	bid	ask
Jan-2012 $12.50 Put	$3.10	$3.20

We'll use the average price — $3.15 Now go to the "Tools" menu, and select "Goal Seek". This will pop open a window, where you will make the following entries:

Set Cell:	G21
To Value:	3.15
By Changing:	B26

G21 is the cell address of the Theoretical Price of the option in the OUTPUT section. 3.15 is what we want it to equal, and B26 is the address of the volatility cell.[3] Then click 'Apply'. Magically, a value of 31.40% should appear in the "Volatility" cell you selected. Select "Close" (not "Cancel"), to keep this value for the volatility.

For the curious: Black-Scholes can't actually be solved for the volatility. So Gnumeric (and Excel) use an iterative process to estimate it. First it makes a guess at what it the answer might be, runs the equation with this guess, and compares the result to the theoretical price of $3.15 you entered. If gnumeric's guess at the volatility resulted in a theoretical price higher or lower than $3.15, it modifies its guess, and repeats (iterates), until the guess is "close enough", or until it is apparent that it can't be done.

Now we are part way to our goal. Remember we are trying to find out what price might encourage the owner of our put to exercise on us. Well, what price would that be?

Recall that since this stock pays no dividends, a rational counterparty will only exercise the put when there is no time-value remaining in the put. Why? Because by exercising and having us pay for the stock, they are getting only intrinsic value. They could sell the put for (intrinsic value + time value) and receive more than if they just sold the stock for intrinsic value.

So now we do a *second* "Goal Seek": this time the "Set Cell:" address should be the address of the Intrinsic Value cell. The "To Value:" box should be zero, or perhaps a penny or two, because perhaps your counterparty would sacrifice a penny, And the "By Changing Cell:" box should contain the address of the stock price cell in the "Input" section.

Doing this with a value of "0.01" in the "To Value:" cell gives a stock price of $7.18 as the one which, if reached, may cause your counterparty to exercise early.

14.3.1 Underlying Assumptions

Of course, there is a big assumption underlying all of this; namely, that the inputs for volatility and the risk-free rate remain constant over this extended period. Of course they won't. The risk-free rate will do whatever the risk-free rate does. Should it go up, option prices will increase for both puts and calls. And this has less of an impact on option prices than volatility.

Volatility is the 500 pound gorilla, here. What you generally see is that as a put falls further into-the-money (as long as it is not *extremely* deep), implied volatility will *drop*. By playing around with the various inputs, you can find out that if implied volatility were to fall to 30%, the early exercise stock price will rise to $7.39.

[3] Most spreadsheets allow you to simply click on the cells, and will put the address into the dialogue box. You may find this easier.

On the other hand, if volatility in the market rises, then perhaps the implied volatility would also rise. An implied volatility of 34% today would drop the early exercise stock price to $6.79 today.

And fiddling further with the inputs shows that this price level will change as time passes — it will move *up*. So if it's one year from now, with an unchanged stock price, and the yield curve remains the same as it is today (it won't, but this is just a thought experiment), the risk-free rate will be about 0.34%. And we'll also assume that the volatility stays the same. Going through the steps above with these new assumptions causes the exercise stock price to reach $7.34. By July-2011, it's at $8.00. By October-2011, it's almost to $9.00 and so on.

Play around with it a bit before you move on. Try different values and see how that changes the price of the option. Try some more goal seek scenarios. Have fun.

14.4 Problems with Black-Scholes

Any mathematical model is, by definition, imperfect. Some things are impossible to quantify (such as investor sentiment) or predict (such as macro-economic events). At best, models provide only a partial picture of reality. Many people think Black-Scholes does a poor job, even considering the limitations inherent in all models. Black-Scholes makes many assumptions, all problematical. Here's a list:

1. Options are not exercised prior to expiration.
2. Markets are frictionless.
3. Interest rates are constant over the option's life.
4. Volatility is constant over the option's life.
5. Trading is continuous, with no gaps in the price changes of the underlying.
6. Volatility is independent of the price of the underlying.
7. Over short periods, the percentage price changes in the underlying are normally distributed, resulting in a lognormal distribution of underlying prices at expiration.

These limitations expose users of Black-Scholes to definite risks:

1. It underestimates extreme moves in the market (called "tail-risk").
2. It assumes a frictionless market, giving "liquidity risk".
3. The assumption of a constant volatility gives "volatility-risk".
4. The assumption of continuous prices gives "gap-risk".

Black and Scholes were two of the key players in the Long Term Capital Management disaster.[4] But the magnitude of the disaster, which was a "tail-risk" disaster if there ever was one, sometimes causes us to overlook the fact that Long Term Capital Management also made gobs and gobs of money. So in fact, the mathematical modeling does appear to work, at least some of the time. The danger lies in regarding the model as infallible.

My own approach to using Black-Scholes is adds another layer to my personal approach to options. First I try to understand the business, and layer option trades based on this understanding. On top of this, I'll run some scenarios through a Black-Scholes calculator to see how that looks. If Black-Scholes predicts a favorable outcome, so much the better for me. If Black-Scholes predicts a strongly unfavorable outcome, this might cause me to reconsider my investment. However, I would never make an investment based on a favorable prediction from Black-Scholes that ran counter to my understanding of the business.

Not every investor agrees with this approach, and many use Black-Scholes exclusively, ignoring the fundamental business. They seem to make money doing this, but I am not comfortable with it. Whatever your personal approach, running various scenarios through Black-Scholes can be very educational, particularly for investors new to options.

14.5 Extending the Model: Incorporating Dividends

One strange assumption that Black-Scholes makes is that the underlying does not pay a dividend. As has been discussed previously, dividends tend to lower the price of call options, and increase the price of put options. While the effects on short-term options are slight, the effects on long-term options such as LEAPS can be substantial, possibly substantial enough to turn a wining position into a losing one.

Fortunately this blemish is easy to fix. There are two methods:

1. Deduct the present value of all dividends that will be paid during the life of the option from the stock price input to the Black-Scholes model.

2. Assume the company pays a consistent dividend yield. Divide the stock price by the exponential function of this yield, multiplied by the time to expiration. The resulting mess is then used instead of the stock price.

Neither method is perfect. The first suffers from future dividends being unknowable — what if they raise or lower them? The second method suffers from over simplification. In a world where an average stock price can fluctuate in 30-50% in value during a single year, a constant yield assumption strikes me as bizarre. As you may have guessed, I am an advocate for the first method, and that is the one that is implemented in the Black-Scholes calculator I distribute.

Start your handy Black-Scholes calculator, and make the entries shown in figure 14.4. Note that we've also changed the column headings in this example — just to remind us

[4]Great book on this: "When Genius Failed" by Roger Lowenstein

Call Option	With Dividend	Without Dividend
Data Entry Date	November 20, 2009	November 20, 2009
Expiration Date	January 20, 2012	January 20, 2012
Stock Price	28.00	28.00
Strike Price	20.00	20.00
Risk-free Rate	1.05%	1.05%
Volatility	32.5%	32.5%
Quarterly Dividends Per Share		
1	$0.13	
2	$0.13	
3	$0.13	
4	$0.13	
5	$0.13	
6	$0.13	
7	$0.13	
8	$0.13	
Total Dividends Received	$1.04	0

Figure 14.4: The effect of dividends on options.

what is going on.

Once you've done this, you'll notice a radical change in the theoretical prices of the options predicted by the model. The option with dividends will have a theoretical price of $9.04. The same option without any dividends will have a theoretical price of $9.89. As the stock price increases, the difference becomes more extreme. For example, at a share price of $100, the model predicts a theoretical price of $79.42 with dividends, and $80.45 without. That's a difference of over $100 per contract!

Still, this is not a loss. But consider what can happen if you were to enter a diagonal spread, selling short-term calls against your long term leap. If you had sold a $27 call when the shares were down, and they moved to $100 at the short calls expiration, your short call would be worth $73.00 (Stock price - strike price of short call = Intrinsic Value). But since you sold it short, that's money you *owe* — you would need to buy the call back. So your profits now look like this:

With Dividends $79.42 - $73.00 = $6.42.

Without Dividends $80.45 - $73.00 = $7.45

Add in commissions, and the cost of the LEAP (which was probably around $7.00), and you very well might be looking at a loss in this situation.

Running such "what-if" scenarios is an excellent application for the Black-Scholes model.

14.6 Grand Finale: The Black Scholes Formula

Now that we have reached the end, as promised, here is the Black-Scholes model, in all its glory.

$$C = pN(d_1) - se^{-rt}N(d_2)$$
$$P = -pN(-d_1) + se^{-rt}N(-d_2)$$

where

$$d_1 = \frac{\ln(p/s) + (r + \sigma^2/2)t}{\sigma\sqrt{t}}$$
$$d_2 = d_1 - \sigma\sqrt{t}$$

- C = theoretical value of a call.
- P = theoretical value of a put.
- p = Stock price.

- $N(x)$ = cumulative normal density function.
- s = strike price of option.
- e = Euler's number (base of the natural logarithm).
- r = risk-free interest rate.
- t = time to expiration in years.
- σ = volatility.

For those who have have journeyed this far with me, thanks for the company. Please don't use what you have learned in this book to make all the money in the world — leave some for the rest of us.

And thanks for listening.

14.7 Chapter Glossary

Standard Deviation Loosely speaking, this is a mathematical description of the average distance from the average of a distribution. It tells you how spread out your population is.

Glossary

Arm One side of a spread position.

American Option an option allowing exercise prior to expiration. All stock options are American-style.

Arbitrage The purchase and sale of the same product in different markets to take advantage of a price disparity between the two markets. The ideal arbitrage is risk-free.

Annualize a method for comparing returns from options or stocks that are held over different time periods. First compute the return on the investment. Then divide the holding period by the number of months you held it, and multiply by 12. Then multiply by the return from your investment.

Assignment The process by which the seller of an option is notified of the buyer's intention to exercise his rights.

At-the-money Strike price of option is equal to current stock price of underlying.

Automatic Exercise When options are in-the-money at expiration, they will be automatically exercised unless prior action is taken.

Bear Spread Any spread that will increase in value with a decline in the price of the underlying.

Break-even point Price at which there are zero losses and zero gains.

Bull Spread Any spread that will increase in value with a rise in price of the underlying contract.

Buy write Simultaneously buying the underlying stock and selling an option on that stock.

Buy To Close Repurchase a short option.

Buy to Open Open a long option position.

Call Option A contract between buyer and seller where the buyer acquires the right, but not the obligation, to purchase a specified underlying contract at a fixed price on or before a specific date. The seller of the call option assumes the obligation of delivering the underlying should the buyer wish to exercise his right.

Called Away Usually used with calls. The buyer of the call exercises his right to buy the shares from the seller calls. The price paid is determined by the strike price of the call option.

Class All options with the same underlying stock and expiration date.

Collar Short call, long stock and long put.

Combination A two-sided option spread which does not fall into any well defined category of spreads.

Covered Call The sale of a call against an existing long position on the underlying. The long position may be a long stock position, or a long call position with a lower strike price.

Covered Write Sale of a call (put) with a covering long (short) position.

Contract a single option. All options are contracts, conveying rights to buyers, obligations to sellers. They specify a term, strike price and underlying stock.

Cover Owning enough stock to cover a sold call. Typically, 100 shares of stock must be owned for each call sold to cover the call. A short call may also be covered by a long call with a lower strike price.

Credit Spread Any spread that you establish for a payment to you.

Debit Spread Any spread that you establish with a payment to someone else.

Delta The rate of change of the option premium with respect to the stock price.

Derivative A security whose price is determined by its relationship to the price of another security. Stock options (calls and puts) are examples of derivatives.

Diagonal Spread Any spread with different strike prices and different expiration dates.

Dividend Yield Dividends paid, expressed as a percentage. Calculated by dividing the dividend per share by the current market value of the stock.

Downside Protection Arranging to protect yourself against potential loss in your position, so that you do not lose money.

Early Exercise Exercise of an option prior to its expiration date.

European option An option that can be exercised only at expiration.

Ex-dividend The first day a dividend-paying stock is trading without the right to receive the dividend.

Exercise The process buy which the holder of an option notifies the seller of his intention to take delivery of the underlying (if a call), or make delivery of the underlying (if a put), at the strike price of the option contract.

Expiration Date The date after which the option may no longer be exercised. expires.

Hedge Using one position to protect another. For example, using one security that will go up in price as another one goes down.

Horizontal Spread A spread with identical strike prices but different expiration dates.

Implied Volatility Assuming all other inputs are known, the volatility that would have to be input into a theoretical pricing model in order to yield a theoretical value identical to the price of the option in the marketplace.

In-the-money For calls: The stock is above the strike price. For puts: The stock is below the strike price.

Intrinsic Value The amount by which an option is in-the-money.

Leg One side of a spread position.

LEAPS Long-term Equity AnticiPation Security. Options with expiration periods of a year or more.

Leverage Use of investment capital that uses a small amount of capital to control a large value.

Lock-in To freeze a loss or profit so they can not be changed.

Long position To buy calls, puts or stocks.

Margin An account with a brokerage firm that contains a minimum amount of cash and securities to provide collateral for short positions or for purchases for which payment has not yet been made.

Naked Option An option sold without a covering long position.

Odd lot Not a round lot. Anything other than a multiple of 100 shares.

Open Interest The number of open contracts of a particular option at any time.

Option A contract specifying the right to buy or sell 100 shares of specific stock, at a specific price, during a specific time period.

Out-of-the-money For calls: The stock is below the strike price. For Puts: The stock price is above the strike price.

Paper Profits Profits that exist only on paper, due to appreciating securities such as stocks or options.

Parity The premium of an option is equal to its intrinsic value.

Point 1/100 of something. Options premiums are specified in points.

Position The total of a trader's open contracts and holdings in a particular underlying market.

Premium The price of an option. Premiums are expressed in points, and must be multiplied by the number of shares in a contract (usually 100) to get the total price for the option.

Put Option Grants the buyer the right to sell shares at the strike price of the option. Goes up in value as the stock price goes down.

Return The ratio of profits to net investment made.

Realized Profits Closing a position to convert paper profits into cash.

Return if Exercised The return an option seller will make if the option is exercised.

Return if Unchanged The return an option seller will make if the option expires worthless. In some cases, when the option was purchased in-the-money and is still in-the-money at expiration, the return if unchanged will be the same as the return if exercised.

Roll down Replace one option with another with a lower strike price.

Roll Forward Replace one option with another with a later expiration date.

Roll Up Replace one option with another with a higher strike price.

Round Lot An even multiple of 100 shares of stock.

Series All options with the same underlying contract, same exercise price, and same expiration date. Subset of a class.

Short Selling shares of stock, or options which you do not own.

Short seller Someone who sells shares or options they do not own.

Side One option in a spread position, either the short option or the long option.

Sigma (σ) The notation used for standard deviation. Since volatility is usually expressed as a standard deviation, the same notation is often used to denote volatility.

Spread A long and a short position held at the same time on the same underlying stock.

Strike Price The price that will be paid for selling or buying 100 share of stock, set at the time of purchase of an option contract.

Theoretical Value An option value generated by a mathematical model given certain assumptions about the option, the contract, market and interest rates.

Time Value the portion of an options premium above the intrinsic value. If the option is out-of-the-money, the entire premium is time value.

Time Value Premium A synonym for time value.

Underlying The stock to be delivered if the contract is exercised.

Vertical Spread A spread using options with different strike prices but identical expiration dates.

Volatility The degree to which the price of a security fluctuates over time.

Wasting asset Any asset that declines in value over time, such as an option.

Write Same as short.

Writer Short seller.

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