expiration; they both make a 5-point profit there. Above 45, the naked write does better; it has larger profits and smaller losses. Below 45, the short sale does better, and the farther the stock falls, the better the short sale becomes in comparison. As will be seen later, one can more closely simulate a short sale by writing an in-the-money naked call.

INVESTMENT REQUIRED

The *margin requirements* for writing a naked call are 20% of the stock price plus the call premium, less the amount by which the stock is below the striking price. If the stock is below the striking price, the differential is subtracted from the requirement. However, a minimum of 10% of the stock price is required for each call, even if the computation results in a smaller number. Table 5-2 gives four examples of how the initial margin requirement would be computed for four different stock prices. The 20% collateral figure is the minimum exchange requirement and may vary somewhat among different brokerage houses. *The call premium may be applied against the requirement.* In the first line of Table 5-2, if the XYZ July 50 call were selling for 7 points, the $700 call premium could be applied against the $1,800 margin requirement, reducing the actual amount that the investor would have to put up as collateral to $1,100.

TABLE 5-2.
Initial collateral requirements for four stock prices.

Call Written	Stock Price When Call Written	Call Price	20% of Stock Price	Out-of-the-Money Differential	Total Margin Requirement
XYZ July 50	55	$700	$1,100	$ 0	$1,800
XYZ July 50	50	400	1,000	0	1,400
XYZ July 50	46	200	920	– 400	720
XYZ July 50	40	100	800	–1,000	400*

*Requirement cannot be less than 10%.

In addition to the basic requirements, a brokerage firm may require that for a customer to participate in uncovered writing, he have a minimum equity in his account. This equity requirement may range from as low as $2,000 to as high as $100,000. Since naked call writing is a high-risk strategy, some brokerage firms require that the customer be able to show both financial wherewithal and option trading experience before the account can be approved for naked call writing.

Naked Option Positions Are Marked to the Market Daily. This means that the collateral requirement for the position is recomputed daily, just as in the short sale of stock. The same margin formula that was described above is applied and, if the stock has risen far enough, the customer will be required to deposit additional collateral or close the position. The need for such a mark to market is obvious. If the underlying stock should rise, the brokerage firm must ensure that the customer has enough collateral to cover the eventuality of buying the stock in the open market and selling it at the striking price if an assignment notice should be received against the naked call. The mark to market works to the customer's favor if the stock falls in price. Excess collateral is then released back into the customer's margin account, and may be used for other purposes.

It is important to realize that, *in order to write a naked call, collateral is all that is required.* No cash need be "invested" if one owns securities with sufficient collateral loan value.

Example: An investor owns 100 shares of a stock selling at $60 per share. This stock is worth $6,000. If the loan rate on stock is 50% of $6,000, this investor has a collateral loan value equal to 50% of $6,000, or $3,000. This investor could write any of the naked calls in Table 5-2 without adding cash or securities to his account. Moreover, he would have satisfied a minimum equity requirement of at least $6,000, since his stock is equity.

This aspect of naked call writing—using collateral value to finance the writing—is attractive to many investors, since one is able to write calls and bring in premiums without disturbing his existing portfolio. Of course, if the stock underlying the naked call should rise too far in price, additional collateral may be called for by the broker because of the mark to market. Moreover, there is risk whether cash or collateral is used. If one buys in a naked call at a loss, he will then be spending cash, creating a debit in his account.

Regardless of how one finances a naked option position, it is generally a good idea to allow enough collateral so that the stock can move all the way to the point at which one would cover the option or take follow-up action. For example, suppose a stock is trading at 50 and one sells an April 60 call naked, figuring that he will cover the call if the stock rises to 60 (that is, if the option becomes an in-the-money option). He should set aside enough collateral to margin the position as if the stock were at 60 (even though the *actual* margin requirement will be smaller than that). If he allows that extra collateral, then he will never be forced into a margin call at a stock price prior to (that is, below) where he wanted to take follow-up action. Simply stated, let the market take you out of a position, not a margin call.

THE PHILOSOPHY OF SELLING NAKED OPTIONS

The first and foremost question one must address when thinking about selling naked options (or any strategy, for that matter) is: "Can I psychologically handle the thought of naked options in my account?" Notice that the question does not have anything to do with whether one has enough collateral or margin to sell calls (although that, too, is important) nor does it ask how much money he will make. First, one must decide if he can be comfortable with the risk of the strategy. Selling naked options means that there is theoretically unlimited risk if the underlying instrument should make a large, sudden, adverse move. It is one's attitude regarding that fact alone that determines whether he should consider selling naked options. If one feels that he won't be able to sleep at night, then *he should not sell naked options*, regardless of any profit projections that might seem attractive.

If one feels that the psychological suitability aspect is not a roadblock, then he can consider whether he has the financial wherewithal to write naked options. On the surface, naked option margin requirements are not large (although in equity and index options, they are larger than they were prior to the crash of 1987).

In general, one would prefer to let the naked options expire worthless, if at all possible, without disturbing them, unless the underlying instrument makes a *significant* adverse move. So, out-of-the-money options are the usual choice for naked selling. Then, in order to reduce (or almost eliminate) the chance of a margin call, *one should set aside the margin requirement as if the underlying had already moved to the strike price of the option sold.* By allowing margin as if the underlying were already at the strike, one will almost never experience a margin call before the underlying price trades up to the strike price, at which time it is best to close the position or to roll the call to another strike.

Thus, for naked equity call options, allow as collateral 20% of the highest naked strike price. In this author's opinion, the biggest mistake a trader can make is to initiate trades because of margin or taxes. Thus, by allowing the "maximum" margin, one can make trading decisions based on what's happening in the market, as opposed to reacting to a margin call from his broker.

"Suitability" also means not risking more money than one can afford to lose. If one allows the "maximum" margin, then he won't be risking a large portion of his equity unless he is unable to cover when the underlying trades through the strike price of his naked option. Gaps in trading prices would be the culprits that could prevent one from covering. Gaps are common in stocks, less common in futures, and almost nonexistent in indices. *Hence, index options are the options of choice when it comes to naked writing.* Index options are discussed later in the book.

Finally, there is one more "rule" that a naked option writer must follow: *Someone has to be watching the position at all times.* Disasters could occur if one were to go on

vacation and not pay attention to his naked options. Usually, one's broker can watch the position, even if the trader has to call him from his vacation site.

In sum, then, to write naked options, one needs to be prepared psychologically, have sufficient funds, be willing to accept the risk, be able to monitor the position every day, sell options whose implied volatility is extremely high, and cover any naked options that become in-the-money options.

RISK AND REWARD

One can adjust the apparent risks and rewards from naked call writing by his selection of an in-the-money or out-of-the-money call. Writing an out-of-the-money call naked, especially one quite deeply out-of-the-money, offers a high probability of achieving a small profit. Writing an in-the-money call naked has the most profit potential, but it also has higher risks.

Example: XYZ is selling at 40 and the July 50 is selling for H. This call could be sold naked. The probability that XYZ could rise to 50 by expiration has to be considered small, especially if there is not a large amount of time remaining in the life of the call. In fact, the stock could rise 25%, or 10 points, by expiration to a price of 50, and the call would still expire worthless. Thus, this naked writer has a good chance of realizing a $50 profit, less commissions. There could, of course, be substantial risk in terms of potential profit versus potential loss if the stock rises substantially in price by expiration. Still, this apparent possibility of achieving additional limited income with a high probability of success has led many investors to use the collateral value of their portfolios to sell deeply out-of-the-money naked calls.

For those employing this technique, a favored position is to have a stock at or just about 15 and then sell the near-term option with striking price 20 naked. This option would sell for one-eighth or one-quarter, perhaps, although at times there might not be any bid at all. At this price, the stock would have to rally nearly one-third, or 33%, for the writer to lose money. Although there are not usually many optionable stocks selling at or just above $10 per share, these same out-of-the-money writers would also be attracted to selling a call with a striking price 15 when the stock is at 10, because a 50% upward move by the stock would be required for a loss to be realized.

This strategy of selling deeply out-of-the-money calls has its apparent attraction in that the writer is assured of a profit unless the underlying stock can rally rather substantially before the call expires. The danger in this strategy is that one or two losses, perhaps amounting to only a couple of points each, could wipe out many periods of profits. The stock market does occasionally rally heavily in a short period, as witnessed repeatedly

throughout history. Thus, the writer who is adopting this strategy cannot regard it as a sure thing and certainly cannot afford to establish the writes and forget them. Close monitoring is required in case the market begins to rally, and by no means should losses be allowed to accumulate.

The opposite end of the spectrum in naked call writing is the writing of fairly deeply in-the-money calls. Since an in-the-money call would not have much time value premium in it, this writer does not have much leeway to the upside. If the stock rallies at all, the writer of the deeply in-the-money naked call will normally experience a loss. However, should the stock drop in price, this writer will make larger dollar profits than will the writer of the out-of-the-money call. The sale of the deeply in-the-money call simulates the profits that a short seller could make, at least until the stock drops close to the striking price, since the delta of a deeply in-the-money call is close to 1.

Example: XYZ is selling at 60 and the July 50 call is selling for 10½. If XYZ rises, the naked writer will lose money, because there is only 0.50 of time value premium in the call. If XYZ falls, the writer will make profits on a point-for-point basis until the stock falls much closer to 50. That is, if XYZ dropped from 60 to 57, the call price would fall by almost 3 points as well. Thus, for quick declines by the stock, the deeply in-the-money write can provide profits nearly equal to those that the short seller could accumulate. Notice that if XYZ falls all the way to 50, the profits on the written call will be large, but will be accumulating at a slower rate as the time value premium builds up with the stock near the striking price.

If one is looking to trade a stock on the short side for just a few points of movement, he might use a deeply in-the-money naked call write instead of shorting the stock. His investment will be smaller—20% of the stock price for the write as compared to 50% of the stock price for the short sale—and his return will thus be larger. (The requirement for the in-the-money amount is offset by applying the call's premium.) The writer should take great caution in ascertaining that the call does have some times premium in it. He does not want to receive an assignment notice on the written call. It is easiest to find time premium in the more distant expiration series, so the writer would normally be safest from assignment by writing the longest-term deep in-the-money call if he wants to make a bearish trade in the stock.

Example: An investor thinks that XYZ could fall 3 or 4 points from its current price of 60 in a quick downward move, and wants to capitalize on that move by writing a naked call. If the April 40 were the near-term call, he might have the choice of selling the April 40 at 20, the July 40 at 20¼, or the October 40 at 20½. Since all three calls will drop nearly point for point with the stock in a move to 56 or 57, he should write the October 40, as it

has the least risk of being assigned. A trader utilizing this strategy should limit his losses in much the same way a short seller would, by covering if the stock rallies, perhaps breaking through overhead technical resistance.

FOLLOW-UP ACTION

Since naked call writing involves theoretically large upside risk, one must monitor the positions constantly. The simplest way to limit losses is to have some sort of stop in mind. For example, if one has written an out-of-the-money call, and now the stock rises to the striking price, that is probably a good time to exit. Some traders prefer to set their stop loss at the break-even point.

Example: With XYZ at 45, a trader writes the July 50 call naked, selling it for 1.00. The break-even point on this write is 51 at expiration. Therefore, a trader might wait until the stock rose to 51 (at any time prior to expiration) before he stopped himself out of the call. Clearly, the call could be worth quite a bit more than 1.00 by the time that the stock rose to 51, especially if the move is a swift one.

Another follow-up action is to take profits—that is, close out the position—if there really isn't that much money left to be made. One can calculate the remaining return to be made by staying in the naked call position. If it is too small, then the call should be covered, and a new position can be established elsewhere.

Example: At some point in the past, a trader wrote the July 50 call naked, selling it for 1.00. Suppose that now, with one month to go until expiration, XYZ is trading at 42, and the call is offered at 0.05. Should it be covered? Suppose that, as stated earlier, this trader is setting aside 20% of the striking price ($1,000) as his collateral for the position so that he doesn't have to take any follow-up action unless the stock reaches 50. The return that is being made on the required collateral can be calculated as follows:

$$\begin{aligned}\text{Annualized current return} &= (\text{call price}) / (\text{margin requirement} \times \text{time remaining}) \\ &= (\text{call price}) / (0.2 \times \text{strike} \times \text{time}) \\ &= 5 / (0.2 \times 5000 \times (1/12)) \\ &= 6\%\end{aligned}$$

Is it worth it to stay in this write, which is earning only 6% on the allocated collateral, as opposed to setting up a new position that might have a much higher return? Probably not. This call should be covered and a new position opened.

ROLLING FOR CREDITS

This is a strategy that should be avoided, although it always seems that it has appeal to a certain set of option traders. In this strategy, one writes an at-the-money call. This could also apply as a follow-up action to a previous naked call write, wherein the stock has risen to the striking price, and so one is short an at-the-money call at that point.

In the rolling for credits strategy, one would wait until the stock reached the *next* strike and would then cover his short calls and simultaneously write *more* calls at the next strike—either in the same month or a later month. He would write *enough* calls so that the credit from writing the calls with the higher strike would compensate for the debit he has to pay to buy back the calls at the lower strike. One would do this repeatedly until, eventually, the stock pulled back, and the last set of written calls expired worthless. He would then profit by the amount of the initial credit, plus any credits generated by further rolls along the way. Mostly, though, those rolls are done for tiny credits, so that the entire process is undertaken to profit by the amount of the initial write.

The problem is that great risk and use of collateral might be required, if one were forced to roll up and up, month after month, while chasing that initial limited profit.

Tables 5-3 and 5-4 show how such a scenario might unfold, if XYZ rose so quickly that one remained in the October calls all the way up. The collateral requirement for this strategy can balloon out of control. Note that each transaction in Table 5-3 is a credit and all (except the last) involve taking a realized loss.

In these tables, while the number of written calls has tripled from 5 to 15, the collateral requirement has more than quadrupled, from $5,000 to $21,000.

TABLE 5-3.
Rolling for credits when stock is rising.

Initially: XYZ = 50	
Sell 5 XYZ October 50's at 7	+$3,500 credit
Later: XYZ rises to 60	
Buy 5 XYZ October 50's at 11 and	– 5,500 debit
sell 8 XYZ October 60's at 7	+ 5,600 credit
Later: XYZ rises further to 70	
Buy 8 XYZ October 60's at 11 and	– 8,800 debit
sell 15 XYZ October 70's at 6	+ 9,000 credit
Finally: XYZ falls and the October 70's expire worthless	
	Net gain = +$3,800

TABLE 5-4.
Increase in collateral requirement.

Initially: XYZ = 50	
Sell 5 XYZ October 50's at 7	$ 5,000 collateral required
($3,500 net credit)	
Later: XYZ = 60	
Sell 8 XYZ October 60's at 7	
Buy 5 October 50's at 11	
($3,600 net credit to date)	$ 9,600 collateral required
Later: XYZ = 70	
Sell 15 XYZ October 70's at 6	
Buy 8 XYZ October 60's at 11	
($3,800 net credit to date)	$21,000 collateral required

Any stock that rose swiftly would be a problem for this strategy. Furthermore, any stock that gapped up and remained up (say, from a takeover bid, or from announcing a huge contract or business partnership) would be ruinous.

This is really a Martingale strategy. That is, one that requires "doubling up" to succeed, and one that can produce ruin if certain physical limits are reached. The classic Martingale strategy is this: Begin by betting one unit; if you lose, double your bet and play again; if you win that bet, you'll have netted a profit of one unit (you lost one, but won two); if you lost the second bet, double your bet again. No matter how many times in a row you lose, keep doubling your bet each time. When you eventually win, you will profit by the amount of your original bet (one unit). Unfortunately, such a strategy cannot be employed in real life. For example, in a gambling casino, after enough consecutive losses, one would bump up against the table limit and would no longer be able to double his bet. While "rolling for credits" doesn't exactly call for one to double the number of written calls each time, it *does* require that one keep increasing his risk exposure in order to profit by the amount of the original credit sold. There is actually a limit here as well: The OCC's position limit could eventually restrict one from being able to roll into the required number of calls at the higher strike. More likely, though, the size of one's collateral is a more common physical limit; eventually, after rolling up repeatedly, the collateral requirement would be too large for the account, and the strategy would result in a huge loss. Martingale strategies should be avoided.

This type of strategy works much better if the calls are covered (see "The Incremental Return Concept" of covered writing on page 81). Also, it might theoretically be possible to use if one were writing puts, because in that case the stock can't fall below zero, but even then the collateral requirements could easily become too onerous to withstand.

TIME VALUE PREMIUM IS A MISNOMER

Once again, the topic of time value premium is discussed, as it was in Chapter 3. Many novice option traders think that if they sell an out-of-the-money option (whether covered or naked), all they have to do is sit back and wait to collect the premium as time wears it away. However, a lot of things can happen between the time an option is sold and its expiration date. The stock can move a great deal, or implied volatility can skyrocket. Both are bad for the option seller and both completely counteract any benefit that time decay might be imparting. The option seller must consider what might happen *during* the life of the option, and not simply view it as a strategy to hold the option until expiration. Naked call writers, especially, should operate with that thought in mind, but so should covered call writers, even though most don't. What the covered writer gives away is the upside; and if he constantly sells options without regard to the possibilities of volatility or stock price increases, he will be doing himself a disservice.

So, while it is still proper to refer to the part of an option's price that is *not* intrinsic value as "time value premium," the knowledgeable option trader understands that it is also more heavily influenced by volatility and stock price movement than by time.

SUMMARY

In a majority of cases, naked call writing is applied as a deeply out-of-the-money strategy in which the investor uses the collateral value of his security holdings to participate in a strategy that offers a large probability of making a very limited profit. It is a poor strategy, because one loss may wipe out many profits. The trader who desires an alternative to a short sale may use the sale of an in-the-money naked call in order to attempt to make a quick profit on a smaller investment than the short seller would have to make. Both of these strategies could entail large risk if one does not have sufficient capital backing.

Follow-up action is necessary in order to keep losses from growing beyond reasonable bounds. Generally, naked calls are bought back when the underlying stock rises above the break-even point. A new, better write can then be established in another stock or another series.

CHAPTER 6

Ratio Call Writing

Two basic types of call writing have been described in previous chapters: covered call writing, in which one owns the underlying stock and sells a call; and naked call writing. Ratio writing is a combination of these two types of positions.

THE RATIO WRITE

Simply stated, *ratio call writing* is the strategy in which one owns a certain number of shares of the underlying stock and sells calls against more shares than he owns. Thus, there is a ratio of calls written to stock owned. The most common ratio is the 2:1 ratio, whereby one owns 100 shares of the underlying stock and sells 2 calls. Note that this type of position involves writing a number of naked call options as well as a number of covered options. This resulting position has both downside risk, as does a covered write, and unlimited upside risk, as does a naked write. The ratio write generally will provide much larger profits than either covered writing or naked writing if the underlying stock remains relatively unchanged during the life of the calls. However, the ratio write has two-sided risk, a quality absent from either covered or naked writing.

Generally, when an investor establishes a ratio write, he attempts to be neutral in outlook regarding the underlying stock. This means that he writes the calls with striking prices closest to the current stock price.

Example: A ratio write is established by buying 100 shares of XYZ at 49 and selling two XYZ October 50 calls at 6 points each. If XYZ should decline in price and be anywhere below 50 at October expiration, the calls will expire worthless and the writer will make 12 points from the sale of the calls. Thus, even if XYZ drops 12 points to a price of 37, the ratio writer will break even. The stock loss of 12 points would be offset by a 12-point gain on the calls. As with

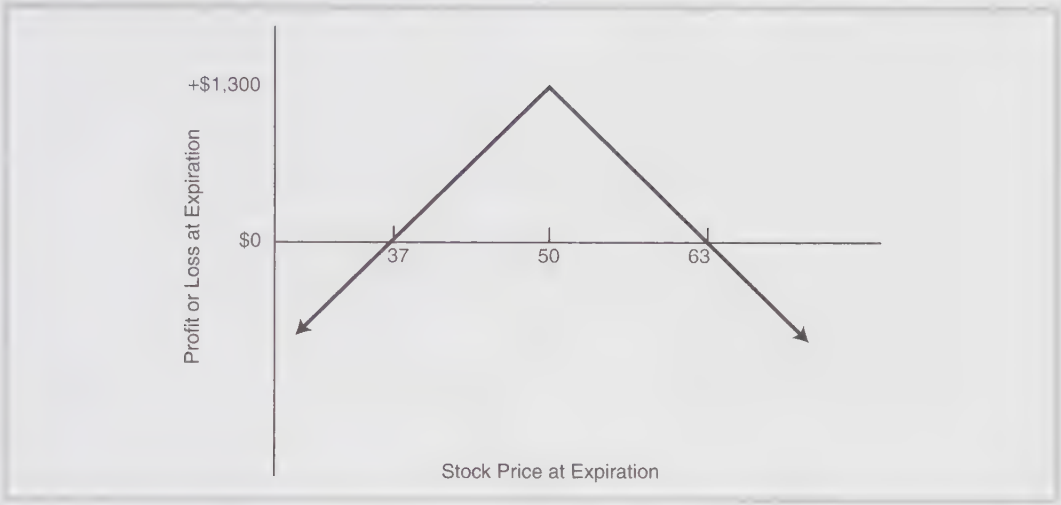
any strategy in which calls are sold, the maximum profit occurs at the striking price of the written calls at expiration. In this example, if XYZ were at 50 at expiration, the calls would still expire worthless for a 12-point gain and the writer would have a 1-point profit on his stock, which has moved up from 49 to 50, for a total gain of 13 points. This position therefore has ample downside protection and a relatively large potential profit. Should XYZ rise above 50 by expiration, the profit will decrease and eventually become a loss if the stock rises too far. To see this, suppose XYZ is at 63 at October expiration. The calls will be at 13 points each, representing a 7-point loss on each call, because they were originally sold for 6 points apiece. However, there would be a 14-point gain on the stock, which has risen from 49 to 63. The overall net is a break-even situation at 63—a 14-point gain on the stock offset by 14 points of loss on the options (7 points each). Table 6-1 and Figure 6-1 summarize the profit and loss potential of this example at October expiration. The shape of the graph resembles a roof with its peak located at the striking price of the written calls, or 50. It is obvious that the position has both large upside risk above 63 and large downside risk below 37. Therefore, it is imperative that the ratio writer plan to take follow-up action if the stock should move outside these prices. follow-up action is discussed later. If the stock remains within the range 37 to 63, some profit will result before commission charges. This range between the downside break-even point and the upside break-even point is called the *profit range.*

This example represents essentially a neutral position, because the ratio writer will make some profit unless the stock falls by more than 12 points or rises by more than 14 points before the expiration of the calls in October. This is frequently an attractive type of strategy to adopt because, normally, stocks do not move very far in a 3- or 6-month time period. Consequently, this strategy has a rather high probability of making a limited profit. The profit in this example would, of course, be reduced by commission costs and margin interest charges if the stock is bought on margin.

TABLE 6-1.
Profit and loss at October expiration.

XYZ Price at Expiration	Stock Profit	Call Price	Profit on Calls	Total Profit
30	–$1,900	0	+$1,200	–$ 700
37	– 1,200	0	+ 1,200	0
45	– 400	0	+ 1,200	+ 800
50	+ 100	0	+ 1,200	+ 1,300
55	+ 600	5	+ 200	+ 800
63	+ 1,400	13	– 1,400	0
70	+ 2,100	20	– 2,800	– 700

FIGURE 6-1.
Ratio write (2:1).

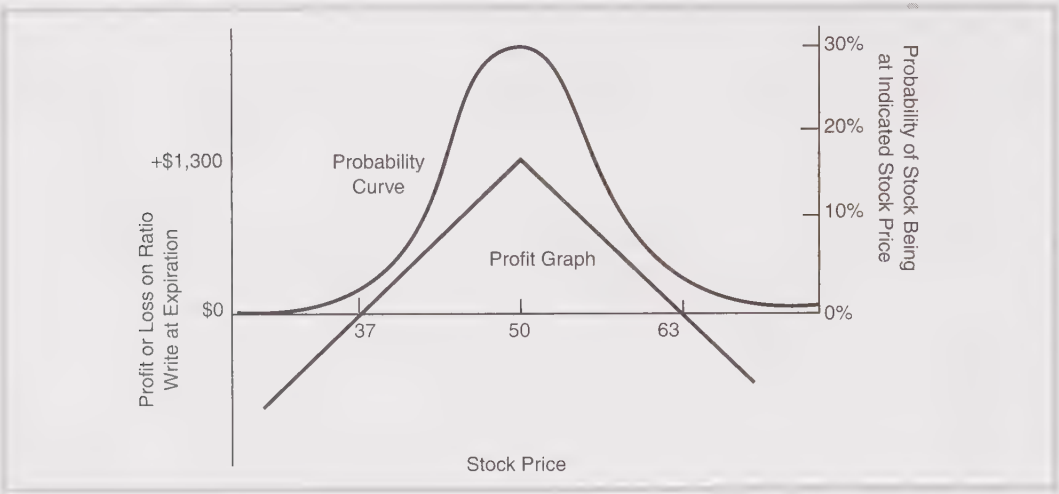


Before discussing the specifics of ratio writing, such as investment required, selection criteria, and follow-up action, it may be beneficial to counter two fairly common objections to this strategy. The first objection, although not heard as frequently today as when listed options first began trading, is "Why bother to buy 100 shares of stock and sell 2 calls? You will be naked one call. Why not just sell one naked call?" The ratio writing strategy and the naked writing strategy have very little in common except that both have upside risk. The profit graph for naked writing (Figure 5-1) bears no resemblance to the roof-shaped profit graph for a ratio write (Figure 6-1). Clearly, the two strategies are quite different in profit potential and in many other respects as well.

The second objection to ratio writing for the conservative investor is slightly more valid. The conservative investor may not feel comfortable with a position that has risk if the underlying stock moves up in price. This can be a psychological detriment to ratio writing: When stock prices are rising and everyone who owns stocks is happy and making profits, the ratio writer is in danger of losing money. However, in a purely strategic sense, one should be willing to assume some upside risk in exchange for larger profits if the underlying stock does not rise heavily in price. The covered writer has upside protection all the way to infinity; that is, he has no upside risk at all. This cannot be the mathematically optimum situation, because stocks never rise to infinity. Rather, the ratio writer is engaged in a strategy that makes its profits in a price range more in line with the way stocks actually behave. In fact, if one were to try to set up the optimum strategy, he would want it to make its most profits in line with the most probable outcomes for a stock's movement. Ratio writing is such a strategy.

Figure 6-2 shows a simple probability curve for a stock's movement. It is most likely

FIGURE 6-2.
Stock price probability curve overlaid on profit graph of ratio write.



that a stock will remain relatively unchanged and there is very little chance that it will rise or fall a great distance. Now compare the results of the ratio writing strategy with the graph of probable stock outcomes. Notice that the ratio write and the probability curve have their "peaks" in the same area; that is, the ratio write makes its profits in the range of most likely stock prices, because there is only a small chance that any stock will increase or decrease by a large amount in a fixed period of time. The large losses are at the edges of the graph, where the probability curve gets very low, approaching zero probability. It should be noted that these graphs show the profit and probability *at expiration*. *Prior to* expiration, the break-even points are closer to the original purchase price of the stock because there will still be some time value premium remaining on the options that were sold.

INVESTMENT REQUIRED

The ratio writer has a combination of covered writes and naked writes. The margin requirements for each of these strategies have been described previously, and the requirements for a ratio writing strategy are the sum of the requirements for a naked write and a covered write. Ratio writing is normally done in a margin account, although one could technically keep the stock in a cash account.

Example: Ignoring commissions, the investment required can be computed as follows: Buy 100 XYZ at 49 on 50% margin and sell 2 XYZ October 50 calls at 6 points each (Table 6-2). The commissions for buying the stock and selling the calls would be added to these require-

TABLE 6-2.
Investment required.

Covered writing portion (buy 100 XYZ and sell 1 call)		
50% of stock price		$2,450
Less premium received	–	600
Requirement for covered portion		$1,850
Naked writing portion (sell 1 XYZ call)		
20% of stock price		$ 980
Less out-of-the-money amount	–	100
Plus call premium	+	600
Less premium received	–	600
Requirement for naked portion		$ 880
Total requirement for ratio write		$2,730

TABLE 6-3.
Initial investment required for a ratio write.

70% of stock cost (XYZ = 49)		$3,430
Plus naked call premiums	+	600
Less total premiums received	–	1,200
Plus or minus striking price differential on naked calls	–	100
Total requirement		$2,730 (plus commissions)

ments. A shorter formula (Table 6-3) is actually more desirable to use. It is merely a combination of the investment requirements listed in Table 6-2.

In addition to the basic requirement, there may be minimum equity requirements and maintenance requirements, since naked calls are involved. As these vary from one brokerage firm to another, it is best for the ratio writer to check with his broker to determine the equity and maintenance requirements. Again, since naked calls are involved in ratio writing, there will be a mark to market of the position. If the stock should rise in price, the investor will have to put up more collateral.

It is conceivable that the ratio writer would want to stay with his original position as long as the stock did not penetrate the upside break-even point of 63. Therefore, he should allow for enough collateral to cover the eventuality of a move to 63. Assuming the October 50 call is at 14 in this case, he would need $3,910 (see Table 6-4). This is the requirement

TABLE 6-4.
Collateral required with stock at upside break-even point of 63.

Covered writing requirement	$1,850 (see Table 6-2)
20% of stock price (XYZ = 63)	1,260
Plus call premium	1,400
Less initial call premium received	– 600
Total requirement with XYZ at 63	$3,910

that the ratio writer should be concerned with, not the initial collateral requirement, and he should therefore plan to invest $3,910 in this position, not $2,730 (the initial requirement). Obviously, he only has to put up $2,730, but from a strategic point of view, he should allow $3,910 for the position. If the ratio writer does this with all his positions, he would not receive a margin call even if all the stocks in his portfolio climbed to their upside break-even points.

SELECTION CRITERIA

To decide whether a ratio write is a desirable position, the writer must first determine the break-even points of the position. Once the break-even points are known, the writer can then decide if the position has a wide enough profit range to allow for defensive action if it should become necessary. One simple way to determine if the profit range is wide enough is to require that the next higher and lower striking prices be within the profit range.

Example: The writer is buying 100 XYZ at 49 and selling 2 October 50 calls at 6 points apiece. It was seen, by inspection, that the break-even points in the position are 37 on the downside and 63 on the upside. A mathematical formula allows one to quickly compute the break-even points for a 2:1 ratio write.

Points of maximum profit = Strike price – Stock price + 2 × Call price
Downside break-even point = Strike price – Points of maximum profit
= Stock price – 2 × Call price
Upside break-even point = Strike price + Points of maximum profit

In this example, the points of maximum profit are 50 – 49 + 2 × 6, or 13. Thus, the downside break-even point would be 37 (50 – 13) and the upside break-even point would be 63 (50 + 13). These numbers agree with the figures determined earlier by analyzing the position.

This profit range is quite clearly wide enough to allow for defensive action should the

underlying stock rise to the next highest strikes of 55 or 60, or fall to the next two lower strikes, at 45 and 40. In practice, a ratio write is not automatically a good position merely because the profit range extends far enough. Theoretically, one would want the profit range to be wide in relation to the volatility of the underlying stock. If the range is wide in relation to the volatility and the break-even points encompass the next higher and lower striking prices, a desirable position is available. Volatile stocks are the best candidates for ratio writing, since their premiums will more easily satisfy both these conditions. A non-volatile stock may, at times, have relatively large premiums in its calls, but the resulting profit range may still not be wide enough numerically to ensure that follow-up action could be taken. Specific measures for determining volatility may be obtained from many data services and brokerage firms. Moreover, methods of computing volatility are presented later in the chapter on mathematical applications, and probabilities are further addressed in the chapters on volatility trading.

Technical support and resistance levels are also important in establishing the position. If both support and resistance lie within the profit range, there is a better chance that the stock will remain within the range. A position should not necessarily be rejected if there is not support and resistance within the profit range, but the writer is then subjecting himself to a possible undeterred move by the stock in one direction or the other.

The ratio writer is generally a neutral strategist. He tries to take in the most time premium that he can to earn the premium erosion while the stock remains relatively unchanged. If one is more bullish on a particular stock, he can set up a 2:1 ratio write with out-of-the-money calls. This allows more room to the upside than to the downside, and therefore makes the position slightly more bullish. Conversely, if one is more bearish on the underlying stock, he can write in-the-money calls in a 2:1 ratio.

There is another way to produce a slightly more bullish or bearish ratio write. This is to *change the ratio of calls written* to stock purchased. This method is also used to construct a neutral profit range when the stock is not close to a striking price.

Example: An investor is slightly bearishly inclined in his outlook for the underlying stock, so he might write more than two calls for each 100 shares of stock purchased. His position might be to buy 100 XYZ at 49 and sell 3 XYZ October 50 calls at 6 points each. This position breaks even at 31 on the downside, because if the stock dropped by 18 points at expiration, the call profits would amount to 18 points and would produce a break-even situation. To the upside, the break-even point lies at 59.50 for the stock at expiration. Each call would be worth 9½ at expiration with the stock at 59.50, and each call would thus lose 3.50 points, for a total loss of 10½ points on the three calls. However, XYZ would have risen from 49 to 59.50—a 10½-point gain—therefore producing a break-even situation. Again, a formula is available to aid in determining the break-even point for any ratio.

$$\text{Maximum profit} = (\text{Striking price} - \text{Stock price}) \times \text{Round lots purchased} + \text{Number of calls written} \times \text{Call price}$$

$$\text{Downside break-even} = \text{Striking price} - \frac{\text{Maximum profit}}{\text{Number of round lots purchased}}$$

$$\text{Upside break-even} = \text{Striking price} + \frac{\text{Maximum profit}}{(\text{Calls written} - \text{Round lots purchased})}$$

Note that in the case of a 2:1 ratio write, where the number of round lots purchased equals 1 and the number of calls written equals 2, these formulate reduce to the ones given earlier for the more common 2:1 ratio write. To verify that the formulae above are correct, insert the numbers from the most recent example.

Example: Three XYZ October 50 calls at a price of 6 were sold against the purchase of 100 XYZ at 49. The number of round lots purchased is 1.

$$\text{Maximum profit} = (50 - 49) \times 1 + 3 \times 6 = 19$$
$$\text{Downside break-even} = 50 - 19/1 = 31$$
$$\text{Upside break-even} = 50 + 19/(3 - 1) = 59.50$$

In the 2:1 ratio writing example given earlier, the break-even points were 37 and 63. The 3:1 write has lower break-even points of 31 and 59.50, reflecting the more bearish posture on the underlying stock.

A more bullish write is constructed by buying 200 shares of the underlying stock and writing three calls. To quickly verify that this ratio (3:2) is more bullish, again use 49 for the stock price and 6 for the call price, and now assume that two round lots were purchased.

$$\text{Maximum profit} = (50 - 49) \times 2 + 3 \times 6 = 20$$
$$\text{Downside break-even} = 50 - 20/2 = 40$$
$$\text{Upside break-even} = 50 + 20/(3 - 2) = 70$$

Thus, this ratio of 3 calls against 200 shares of stock has break-even points of 40 and 70, reflecting a more bullish posture on the underlying stock.

A 2:1 ratio may not necessarily be neutral. There is, in fact, a mathematically correct way of determining exactly what a neutral ratio should be. *The neutral ratio is determined by dividing the delta of the written call into 1.* Assume that the delta of the XYZ October 50 call in the previous example is .60. Then the neutral ratio is 1.0/.60, or 5 to 3. This means that one might buy 300 shares and sell 5 calls. Using the formulae above, the details of this position can be observed:

Maximum profit = $(50 - 49) \times 3 + 5 \times 6 = 33$
Downside break-even = $50 - 33/3 = 39$
Upside break-even = $50 + 33/(5 - 3) = 66.50$

According to the mathematics of the situation, then, this would be a neutral position initially. It is often the case that a 5:3 ratio is approximately neutral for an at-the-money call.

By now, the reader should have recognized a similarity between the ratio writing strategy and the reverse hedge (or synthetic straddle) strategy presented in Chapter 4. The two strategies are the reverse of each other; in fact, this is how the reverse hedge strategy acquired its name. The ratio write has a profit graph that looks like a roof, while the reverse hedge has a profit graph that looks like a trough—the roof upside down (see Figure 4–2). In one strategy the investor buys stock and sells calls, while the other strategy is just the opposite—the investor shorts stock and buys calls. Which one is better? The answer depends on whether the calls are "cheap" or "expensive." Even though ratio writing has limited profits and potentially large losses, the strategy will result in a profit in a large majority of cases, if held to expiration. However, one may be forced to make adjustments to stock moves that occur prior to expiration. The reverse hedge (synthetic *long* straddle) strategy, with its limited losses and potentially large profits, provides profits only on large stock moves—a less frequent event. Thus, in stable markets, the ratio writing strategy is generally superior. However, in times of depressed option premiums, the synthetic long straddle gains a distinct advantage. If calls are underpriced, the advantage lies with the buyer of calls, and that situation is inherent in the synthetic long straddle.

The summaries stated in the above paragraph are rather simplistic ones, referring mostly to what one can expect from the strategies if they are held until expiration, *without adjustment*. In actual trading situations, it is much more likely that one would have to make adjustments to the ratio write along the way, thus disturbing or perhaps even eliminating the profit range. Such travails do not befall the reverse hedge (simulated straddle buy). Consequently, when one takes into consideration the stock movements that can take place *prior to* expiration, the ratio write loses some of its attractiveness and the reverse hedge gains some.

THE VARIABLE RATIO WRITE (SYNTHETIC SHORT STRANGLE)

In ratio writing, one generally likes to establish the position when the stock is trading relatively close to the striking price of the written calls. However, it is sometimes the case that the stock is nearly exactly between two striking prices and neither the in-the-money nor the out-of-the-money call offers a neutral profit range. If this is the case, and one still wants to be in a 2:1 ratio of calls written to stock owned, he can sometimes write one in-the-money

call and one out-of-the-money call against each 100 shares of common. This strategy is called a synthetic short straddle, although it is also known by the names variable ratio write or trapezoidal hedge.

Example: Given the following prices: XYZ common, 65; XYZ October 60 call, 8; and XYZ October 70 call, 3.

If one were to establish a 2:1 ratio write with only the October 60's, he would have a somewhat bearish position. His profit range would be 49 to 71 at expiration. Since the stock is already at 65, this means that he would be allowing room for 16 points of downside movement and only 6 points on the upside. This is certainly not neutral. On the other hand, if he were to attempt to utilize only the October 70 calls in his ratio write, he would have a bullish position. This profit range for the October 70 ratio write would be 59 to 81 at expiration. In this case, the stock at 65 is too close to the downside break-even point in comparison to its distance from the upside break-even point.

A more neutral position can be established by buying 100 XYZ and selling one October 60 and one October 70. This position has a profit range that is centered about the current stock price. Moreover, the new position has both an upside and a downside risk, as does a more normal ratio write. However, *now the maximum profit can be obtained anywhere between the two strikes at expiration*. To see this, note that if XYZ is anywhere between 60 and 70 at expiration, the stock will be called away at 60 against the sale of the October 60 call, and the October 70 call will expire worthless. It makes no difference whether the stock is at 61 or at 69; the same result will occur. Table 6-5 and Figure 6-3 depict the results from this synthetic short strangle at expiration. In the table, it is assumed that the option is bought back at parity to close the position, but if the stock were called away, the results would be the same.

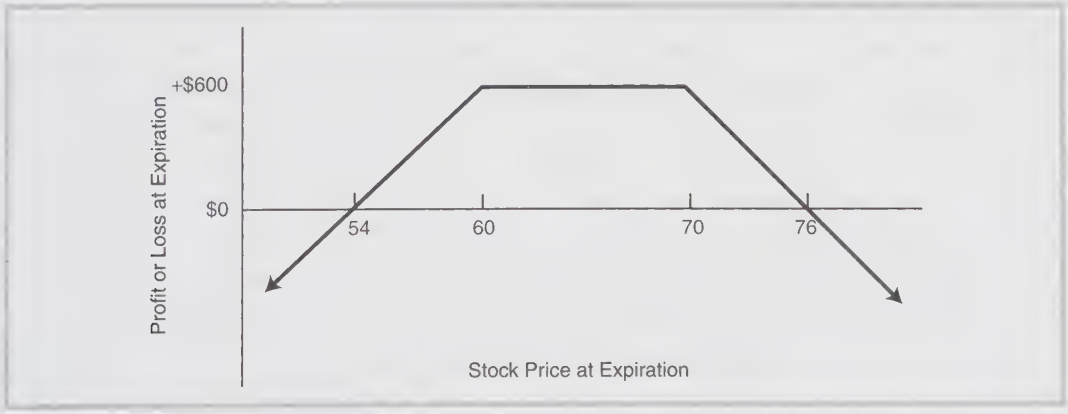
Note that the shape of Figure 6-3 is something like a trapezoid. This is the source of the name "trapezoidal hedge," although the strategy is more commonly known as a synthetic short strangle or variable ratio write. The reader should observe that the maximum profit is indeed obtained if the stock is anywhere between the two strikes at expiration. The maximum profit potential in this position, $600, is smaller than the maximum profit potential available from writing only the October 60's or only the October 70's. However, there is a vastly greater probability of realizing the maximum profit in a variable ratio write than there is of realizing the maximum profit in a normal ratio write. Note that the profit graph in Figure 6.3 is the inverse of the profit graph of the synthetic *long* strangle shown in Figure 4-3.

The break-even points for synthetic short strangle can be computed most quickly by first computing the maximum profit potential, which is equal to the time value that the writer takes in. The break-even points are then computed directly by subtracting the points of maximum profit from the lower striking price to get the downside break-even point and

TABLE 6-5.
Results at expiration of variable hedge.

XYZ Price at Expiration	XYZ Profit	October 60 Profit	October 70 Profit	Total Profit
45	–$2,000	+$ 800	+$ 300	–$900
50	– 1,500	+ 800	+ 300	– 400
54	– 1,100	+ 800	+ 300	0
60	– 500	+ 800	+ 300	+ 600
65	0	+ 300	+ 300	+ 600
70	+ 500	– 200	+ 300	+ 600
76	+ 1,100	– 800	– 300	0
80	+ 1,500	–$1,200	– 700	– 400
85	+ 2,000	– 1,700	– 1,200	– 900

FIGURE 6-3.
Variable ratio write (trapezoidal hedge).



adding the points of maximum profit to the upper striking price to arrive at the upside break-even point. This is a similar procedure to that followed for a normal ratio write:

Points of maximum profit = Total option premiums + Lower striking price – Stock price

Downside break-even point = Lower striking price – Points of maximum profit

Upside break-even point = Higher striking price + Points of maximum profit

Substituting the numbers from the example above will help to verify the formula. The total points of option premium brought in were 11 (8 for the October 60 and 3 for the October 70). The stock price was 65, and the striking prices involved were 60 and 70.

Points of maximum profit = 11 + 60 – 65 = 6
Downside break-even point = 60 – 6 = 54
Upside break-even point = 70 + 6 = 76

Thus, the break-even points as computed by the formula agree with Table 6-5 and Figure 6-3. Note that the formula applies only if the stock is initially between the two striking prices and the ratio is 2:1. If the stock is above both striking prices, the formula is not correct. However, the writer should not be attempting to establish a variable ratio write with two in-the-money calls.

FOLLOW-UP ACTION

Aside from closing the position completely, there are three reasonable approaches to follow-up action in a ratio writing situation. The first, and most popular, is to roll the written calls up if the stock rises too far, or to roll down if the stock drops too far. A second method uses the delta of the written calls. The third follow-up method is to utilize stops on the underlying stock to alter the ratio of the position as the stock moves either up or down. In addition to these types of defensive follow-up action, the investor must also have a plan in mind for taking profits as the written calls approach expiration. These types of follow-up action are discussed separately.

ROLLING UP OR DOWN AS A DEFENSIVE ACTION

The reader should already be familiar with the definition of a rolling action: The currently written calls are bought back and calls at a different striking price are written. The ratio writer can use rolling actions to his advantage to readjust his position if the underlying stock moves to the edges of his profit range.

The reason one of the selection criteria for a ratio write was the availability of both the next higher and next lower striking prices was to facilitate the rolling actions that might become necessary as a follow-up measure. Since an option has its greatest time premium when the stock price and the striking price are the same, one would normally want to roll exactly at a striking price.

Example: A ratio writer bought 100 XYZ at 49 and sold two October 50 calls at 6 points each. Subsequently, the stock drops in price and the following prices exist: XYZ, 40; XYZ October 50, 1; and XYZ October 40, 4.

One would roll down to the October 40 calls by buying back the 2 October 50's that he is short and selling 2 October 40's. In so doing, he would reestablish a somewhat neutral position. His profit on the buy-back of the October 50 calls would be 5 points each—they were originally sold for 6—and he would realize a 10-point gain on the two calls. This 10-point gain effectively reduces his stock cost from 49 to 39, so that he now has the equivalent of the following position: long 100 XYZ at 39 and short 2 XYZ October 40 calls at 4. This adjusted ratio write has a profit range of 31 to 49 and is thus a new, neutral position with the stock currently at 40. The investor is now in a position to make profits if XYZ remains near this level, or to take further defensive action if the stock experiences a relatively large change in price again.

Defensive action to the upside—rolling up—works in much the same manner.

Example: The initial position again consists of buying 100 XYZ at 49 and selling two October 50 calls at 6. If XYZ then rose to 60, the following prices might exist: XYZ, 60; XYZ October 50, 11; and XYZ October 60,6.

The ratio writer could thus roll this position up to reestablish a neutral profit range. If he bought back the two October 50 calls, he would take a 5-point loss on each one for a net loss on the calls of 10 points. This would effectively raise his stock cost by 10 points, to a price of 59. The rolled-up position would then be long 100 XYZ at 59 and short 2 October 60 calls at 6. This new, neutral position has a profit range of 47 to 73 at October expiration.

In both of the examples above, the writer could have closed out the ratio write at a very small profit of about 1 point before commissions. This would not be advisable, because of the relatively large stock commissions, unless he expects the stock to continue to move dramatically. Either rolling up or rolling down gives the writer a fairly wide new profit range to work with, and he could easily expect to make more than 1 point of profit if the underlying stock stabilizes at all.

Having to take rolling defensive action immediately after the position is established is the most detrimental case. If the stock moves very quickly after having set up the position, there will not be much time for time value premium erosion in the written calls, and this will make for smaller profit ranges after the roll is done. It may be useful to use technical support and resistance levels as keys for when to take rolling action if these levels are near the break-even points and/or striking prices.

It should be noted that this method of defensive action—rolling at or near striking prices—automatically means that one is buying back little or no time premium and is selling the greatest amount of time premium currently available. That is, if the stock rises, the call's premium will consist mostly of intrinsic value and very little of time premium

value, since it is substantially in-the-money. Thus, the writer who rolls up by buying back this in-the-money call is buying back mostly intrinsic value and is selling a call at the next strike. This newly sold call consists mostly of time value. By continually buying back "real" or intrinsic value and by selling "thin air" or time value, the writer is taking the optimum neutral action at any given time.

If a stock undergoes a dramatic move in one direction or the other, the ratio writer will not be able to keep pace with the dramatic movement by remaining in the same ratio.

Example: If XYZ was originally at 49, but then undergoes a fairly straight-line move to 80 or 90, the ratio writer who maintains a 2:1 ratio will find himself in a deplorable situation. He will have accumulated rather substantial losses on the calls and will not be able to compensate for these losses by the gain in the underlying stock. A similar situation could arise to the downside. If XYZ were to plunge from 49 to 20, the ratio writer would make a good deal of profit from the calls by rolling down, but may still have a larger loss in the stock itself than the call profits can compensate for.

Many ratio writers who are large enough to diversify their positions into a number of stocks will continue to maintain 2:1 ratios on all their positions and will simply close out a position that has gotten out of hand by running dramatically to the upside or to the downside. These traders believe that the chances of such a dramatic move occurring are small, and that they will take the infrequent losses in such cases in order to be basically neutral on the other stocks in their portfolios.

There is, however, a way to combat this sort of dramatic move. This is done by *altering the ratio* of the covered write as the stock moves either up or down. For example, as the underlying stock moves up dramatically in price, the ratio writer can decrease the number of calls outstanding against his long stock each time he rolls. Eventually, the ratio might decrease as far as 1:1, which is nothing more than a covered writing situation. As long as the stock continues to move in the same upward direction, the ratio writer who is decreasing his ratio of calls outstanding will be giving more and more weight to the stock gains in the ratio write and less and less weight to the call losses. It is interesting to note that this decreasing ratio effect can also be produced by buying extra shares of stock at each new striking price as the stock moves up, and simultaneously keeping the number of outstanding calls written constant. In either case, the ratio of calls outstanding to stock owned is reduced.

When the stock moves down dramatically, a similar action can be taken to increase the number of calls written to stock owned. Normally, as the stock falls, one would sell out some of his long stock and roll the calls down. Eventually, after the stock falls far enough, he would be in a naked writing position. The idea is the same here: As the stock

falls, more weight is given to the call profits and less weight is given to the stock losses that are accumulating.

This sort of strategy is more oriented to extremely large investors or to firm traders, market-makers, and the like. Commissions will be exorbitant if frequent rolls are to be made, and only those investors who pay very small commissions or who have such a large holding that their commissions are quite small on a percentage basis will be able to profit substantially from such a strategy.

ADJUSTING WITH THE DELTA

The delta of the written calls can be used to determine the correct ratio to be used in this ratio-adjusting defensive strategy. The basic idea is to use the call's delta to remain as neutral as possible at all times.

Example: An investor initially sets up a neutral 5:3 ratio of XYZ October 50 calls to XYZ stock, as was determined previously. The stock is at 49 and the delta is .60. Furthermore, suppose the stock rises to 57 and the call now has a delta of .80. The neutral ratio would currently be 1/.80 (= 1.20) or 5:4. The ratio writer could thus buy another 100 shares of the underlying stock.

Alternatively, he might buy in one of the short calls. In this particular example, buying in one call would produce a 4:3 ratio, which is not absolutely correct. If he had had a larger position initially, it would be easier to adjust to fractional ratios. When the stock declines, it is necessary to increase the ratio. This can be accomplished by either selling more calls or selling out some of the long stock. In theory, these adjustments could be made constantly to keep the position neutral. In practice, one would allow for a few points of movement by the underlying stock before adjusting. If the underlying stock rises too far, it may be logical for the neutral strategist to adjust by rolling up. Similarly, he would roll down if the stock fell to or below the next lower strike. The neutral ratio in that case is determined by using the delta of the option into which he is rolling.

Example: With XYZ at 57, an investor is contemplating rolling up to the October 60's from his present position of long 300 shares and short 5 XYZ October 50's. If the October 60 has a delta of .40, the neutral ratio for the October 60's is 2.5:1 ($1 \div .40$). Since he is already long 300 shares of stock, he should now be short 7.5 calls (3×2.5). Obviously, he would sell 7 or 8, probably depending on his short-term outlook for the stock.

If one prefers to adopt an even more sophisticated approach, he can make adjustments between striking prices by altering his stock position, and can make adjustments

by rolling up or down if the stock reaches a new striking price. For those who prefer formulae, the following ones summarize this information:

1. When establishing a new position or when rolling up or down, at the next strike:

$$\text{Number of calls to sell} = \frac{\text{Round lots held long}}{\text{Delta of call to be sold}}$$

Note: When establishing a new position, one must first decide how many shares of the underlying stock he can buy before utilizing the formula; 1,000 shares would be a workable amount.

2. When adjusting between strikes by buying or selling stock:

$$\text{Number of round lots to buy} = \text{Current delta} \times \text{Number of short calls} - \text{Round lots held long}$$

Note: If a negative number results, stock should be sold, not bought.

These formulae can be verified by using the numbers from the examples above. For example, when the delta of the October 50 was .80 with the stock at 57, it was seen that buying 100 shares of stock would reestablish a neutral ratio.

$$\text{Number of round lots to buy} = .80 \times 5 - 3 = 4 - 3 = 1$$

Also, if the position was to be rolled up to the October 60 (delta = .40), it was seen that 7.5 October 60's would theoretically be sold:

$$\text{Number of calls to sell} = \frac{3}{.40} = 7.5$$

There is a more general approach to this problem, one that can be applied to any strategy, no matter how complicated. It involves computing whether the position is net short or net long. The net position is reduced to an equivalent number of shares of common stock and is commonly called the "equivalent stock position" (ESP). Here is a simple formula for the equivalent stock position of any option position:

$$\text{ESP} = \text{Option quantity} \times \text{Delta} \times \text{Shares per option}$$

Example: Suppose that one is long 10 XYZ July 50 calls, which currently have a delta of .45. The option is an option on 100 shares of XYZ. Thus, the ESP can be computed:

$$\text{ESP} = 10 \times .45 \times 100 = 450 \text{ shares}$$

This is merely saying that owning 10 of these options is equivalent to owning 450 shares of the underlying common stock, XYZ. The reader should already understand this, in that an option with a delta of .45 would appreciate by .45 points if the common stock moved up 1 dollar. Thus, 10 options would appreciate by 4.5 points, or $450. Obviously, 450 shares of common stock would also appreciate by $450 if they moved up by one point.

Note that there are some options—those that result from a stock split—that are for more than 100 shares. The inclusion of the term "shares per option" in the formula accounts for the fact that such options are equivalent to a different amount of stock than most options.

The ESP of an entire option and stock position can be computed, even if several different options are included in the position. The advantage of this simple calculation is that an entire, possibly complex option position can be reduced to one number. The ESP shows how the position will behave for short-term market movements.

Look again at the previous example of a ratio write. The position was long 300 shares and short 5 options with a current delta of .80 after the stock had risen to 57. The ESP of the 5 October 50's is short 400 shares (5 x .80 x 100 shares per option). The position is also long 300 shares of stock, so the total ESP of this ratio write is short 100 shares.

This figure gives the strategist a measure of perspective on his position. He now knows that he has a position that is the equivalent of being short 100 shares of XYZ. Perhaps he is bearish on XYZ and therefore decides to do nothing. That would be fine; at least he knows that his position is short.

Normally, however, the strategist would want to adjust his position. Again returning to the previous example, he has several choices in reducing the ESP back to neutral. An ESP of 0 is considered to be a perfectly neutral position. Obviously, one could buy 100 shares of XYZ to reduce the 100-share delta short. Or, given that the delta of the October 50 call is .80, he could buy in 1.25 of these short calls (obviously he could only buy 1; fractional options cannot be purchased).

Later chapters include more discussions and examples using the ESP. It is a vital concept that no strategist who is operating positions involving multiple options should be without. The only requirement for calculating it is to know the delta of the options in one's position. Those are easily obtainable from one's broker or from a number of computer services, software programs, or websites.

For investors who do not have the funds or are not in a position to utilize such a ratio

adjusting strategy, there is a less time-consuming method of taking defensive action in a ratio write.

USING STOP ORDERS AS A DEFENSIVE STRATEGY

A ratio writer can use buy or sell stops on his stock position in order to automatically and unemotionally adjust the ratio of his position. This type of defensive strategy is not an aggressive one and will provide some profits unless a whipsaw occurs in the underlying stock.

As an example of how the use of stop orders can aid the ratio writer, let us again assume that the same basic position was established by buying XYZ at 49 and selling two October 50 calls at 6 points each. This produces a profit range of 37 to 63 at expiration. If the stock begins to move up too far or to fall too far, the ratio writer can adjust the ratio of calls short to stock long automatically, through the use of stop orders on his stock.

Example: An investor places a "good until canceled" stop order to buy 100 shares of XYZ at 57 at the same time that he establishes the original position. If XYZ should get to 57, the stop would be set off and he would then own 200 shares of XYZ and be short 2 calls. That is, he would have a 200-share covered write of XYZ October 50 calls.

To see how such an action affects his overall profit picture, note that his average stock cost is now 53; he paid 49 for the first 100 shares and paid 57 for the second 100 shares bought via the stop order. Since he sold the calls at 6 each, he essentially has a covered write in which he bought stock at 53 and sold calls for 6 points. This does not represent a lot of profit potential, but it will ensure some profit unless the stock falls back below the new break-even point. This new break-even point is 47—the stock cost, 53, less the 6 points received for the call. He will realize the maximum profit potential from the covered write as long as the stock remains above 50 until expiration. Since the stock is already at 57, the probabilities are relatively strong that it will remain above 50, and even stronger that it will remain above 47, until the expiration date. If the buy stop order was placed just above a technical resistance area, this probability is even better.

Hence, *the use of a buy stop order on the upside allows the ratio writer to automatically convert the ratio write into a covered write* if the stock moves up too far. Once the stop goes off, he has a position that will make some profit as long as the stock does not experience a fairly substantial price reversal.

Downside protective action using a sell stop order works in a similar manner.

Example: The investor placed a "good until canceled" sell stop for 100 shares of stock after establishing the original position. If this sell stop were placed at 41, for example, the

position would become a naked call writer's position if the stock fell to 41. At that time, the 100 shares of stock that he owned would be sold, at an 8-point loss, but he would have the capability of making 12 points from the sale of his two calls as long as the stock remained below 50 until expiration. In fact, his break-even point after converting into the naked write would actually be 52 at expiration, since at that price, the calls could be bought back for 2 points each, or 8 points total profit, to offset the 8-point loss on the stock. This action limits his profit potential, but will allow him to make some profit as long as the stock does not experience a strong price reversal and climb back above 52 by expiration.

There are several advantages for inexperienced ratio writers to using this method of protection. First, the implementation of the protective strategies—buying an extra 100 shares of stock if the stock moves up, or selling out the 100 shares that are long if the stock moves down—is unemotional *if the stop orders are placed at the same time that the original position is established.* This prevents the writer from attempting to impose his own market judgment in the heat of battle. That is, if XYZ has moved up to 57, the writer who has not placed a buy stop order may be tempted to wait just a little longer, hoping for the stock to fall in price. If the stop orders are placed as soon as the position is established, a great deal of emotion is removed. Second, *this strategy will produce some profit*—assuming that the stops are properly placed—*as long as the stock does not whipsaw* or experience a price reversal and go back through the striking price in the other direction. Most follow-up actions in any writing strategy, whether they involve rolling actions or the use of stops, are subject to losses if the stock whipsaws back and forth.

The disadvantage to using this type of protective action is that the writer may be tying up relatively large amounts of capital in order to make only a small profit after the stop order is set off. However, in a diversified portfolio, only a small percentage of the stocks may go through their stop points, thereby still allowing the ratio writer plenty of profit potential on his other positions.

Once either the buy stop or the sell stop is set off, the writer still needs to watch the position. *His first action after one stop is touched should be to cancel the other stop order,* because the stops are good orders until they are canceled. From that time on, the writer need do nothing if the stock does not experience a price reversal. In fact, he would just as soon have the stock experience a greater move in the same direction to minimize the chances of a price reversal.

If a price reversal does occur, the most conservative action is to close out the position just after the stock crosses back through the striking price. This will normally result in a small loss, but, again, it should happen in only a relatively small number of his positions. Recall that in a limited profit strategy such as ratio writing, it is important to limit losses as well. If the stock does indeed whipsaw and the position is closed, the writer will still

have most of his original equity and can then reestablish a new position in another underlying stock.

Placement of Stops. The writer would ideally like to place his stops at prices that allow a reasonable rate of return to be made, while also having the stops far enough away from the original striking price to reduce the chances of a whipsaw occurring. It is a fairly simple matter to calculate the returns that could be made, after commissions are included, if one or the other of the stops goes off. Dividends should be included as well, since they will accrue to the writer. If the writer is willing to accept returns as low as 5% annually for those positions that go through their stop points, he will be able to place his stops farther from the original striking price. If he feels that he needs a higher return when the stops go off, the stops must be placed closer in. As with any stock or option investment, the writer who operates in large size will experience less of a commission charge, percentagewise. That is, the writer who is buying 500 shares of stock and selling 10 calls to start with will be able to place his stop points farther out than the writer who is buying 100 shares of stock and selling 2 calls.

Technical analysis can be helpful in selecting the stop points as well. If there is resistance overhead, the buy stop should be placed above that resistance. Similarly, if there is support, the sell stop should be placed beneath the support point. Later, when straddles are discussed, it will be seen that this type of strategy can be operated at less of a net commission charge, since the purchase and sale of stock will not be involved.

CLOSING OUT THE WRITE

The methods of follow-up action discussed above deal with the eventuality of preventing losses. However, if all goes well, the ratio write will begin to accrue profits as the stock remains relatively close to the original striking price. *To retain these paper profits that have accrued, it is necessary to move the protective action points closer together.*

Example: XYZ is at 51 after some time has passed, and the calls are at 3 points each. The writer would, at this time, have an unrealized profit of $800—$200 from the stock purchase at 49, and $300 each on the two calls, which were originally sold at 6 points each. Recall that the maximum potential profit from the position, if XYZ were exactly at 50 at expiration, is $1,300. The writer would like to adjust the protective points so that nearly all of the $800 paper profit might be retained while still allowing for the profit to grow to the $1,300 maximum.

At expiration, $800 profit would be realized if XYZ were at 45 or at 55. This can be verified by referring again to Table 6-1 and Figure 6-1. The 45 to 55 range is now the area that the writer must be concerned with. The original profit range of 39 to 61 has become

meaningless, since the position has performed well to this point in time. If the writer is using the rolling method of protection, he would roll forward to the next expiration series if the stock were to reach 45 or 55. If he is using the stop-out method of protection, he could either close the position at 45 or 55 or he could roll to the next expiration series and readjust his stop points. The neutral strategist using deltas would determine the number of calls to roll forward to by using the delta of the longer-term call.

By moving the protective action points closer together, the ratio writer can then adjust his position while he still has a profit; he is attempting to "lock in" his profit. As even more time passes and expiration draws nearer, it may be possible to move the protective points even closer together. Thus, as the position continues to improve over time, the writer should be constantly "telescoping" his action points and finally roll out to the next expiration series. This is generally the more prudent move, because the commissions to sell stock to close the position and then buy another stock to establish yet another position may prove to be prohibitive. In summary, then, as a ratio write nears expiration, the writer should be concerned with an ever-narrowing range within which his profits can grow but outside of which his profits could dissipate if he does not take action.

COMMENTS ON DELTA-NEUTRAL TRADING

Since the concept of delta-neutral positions was introduced in this chapter, this is an appropriate time to discuss them in a general way. Essentially, a delta-neutral position is a hedged position in which at least two securities are used—two or more different options, or at least one option plus the underlying. The deltas of the two securities offset each other so that the position starts out with an "equivalent stock position" (ESP) of 0. Another term for ESP is "position delta." Thus, in theory, there is no price risk to begin with; the position is neutral with respect to price movement of the underlying. That definition lasts for about a nanosecond.

As soon as time passes, or the stock moves, or implied volatility changes, the deltas change and therefore the position is no longer delta-neutral. Many people seem to have the feeling that a delta-neutral position is somehow one in which it is easy to make money without predicting the price direction of the underlying. That is not true.

Delta-neutral trading is not "easy": Either (1) one assumes some price risk as soon as the stock begins to move, or (2) one keeps constantly adjusting his deltas to keep them neutral. Method 2 is often not feasible for public traders because of commissions. It is even difficult for market-makers, who pay no commissions. Most public practitioners of delta-neutral trading establish a neutral position, but then refrain from adjusting it too often.

A common mistake that novice traders make with delta-neutral trading is to *short* options in a neutral manner, figuring that they have little exposure to price change because

the position is delta-neutral. However, a sizeable move by the underlying (which often happens in a short period of time) ruins the neutrality of the position and inevitably costs the trader a lot of money. A simple example: If one sells a naked straddle (i.e., he sells a naked put and a naked call with both having the same striking price) with the stock initially just below the strike price, that's a delta-neutral position. However, the position has naked options on both sides, and therefore has tremendous liability.

In practice, professionals watch more than just the delta; they also watch other measures of the risk of a position. Even then, price and volatility changes can cause problems. Advanced risk concepts are addressed more fully in the chapter on Advanced Concepts.

SUMMARY

Ratio writing is a viable, neutral strategy that can be employed with differing levels of sophistication. The initial ratio of short calls to long stock can be selected simplistically by comparing one's opinion for the underlying stock with projected break-even points from the position. In a more sophisticated manner, the delta of the written calls can be used to determine the ratio.

Since the strategy has potentially large losses either to the upside or the downside, follow-up action is mandatory. This action can be taken by simple methods such as rolling up or down in a constant ratio, or by placing stop orders on the underlying stock. A more sophisticated technique involves using the delta of the option to either adjust the stock position or roll to another call. By using the delta, a theoretically neutral position can be maintained at all times.

Ratio writing is a relatively sophisticated strategy that involves selling naked calls. It is therefore not suitable for all investors. Its attractiveness lies in the fact that vast quantities of time value premium are sold and the strategy is profitable for the most probable price outcomes of the underlying stock. It has a relatively large probability of making a limited profit, if the position can be held until expiration without frequent adjustment.

CHAPTER 7

Bull Spreads Using Call Options

AN INTRODUCTION TO CALL SPREAD STRATEGIES

A *spread* is a transaction in which one simultaneously buys one option and sells another option, with different terms, on the same underlying security. In a call spread, the options are all calls. The basic idea behind spreading is that the strategist is using the sale of one call to reduce the risk of buying another call. The short call in a spread is considered covered, for margin purposes, only if the long call has an expiration date equal to or longer than the short call. Before delving into the individual types of spreads, it may be beneficial to cover some general facts that pertain to most spread situations.

All spreads fall into three broad categories: *vertical*, *horizontal*, or *diagonal*. A *vertical spread* is one in which the calls involved have the same expiration date but different striking prices. An example might be to buy the XYZ October 30 and sell the October 35 simultaneously. A *horizontal spread* is one in which the calls have the same striking price but different expiration dates. This is a horizontal spread: Sell the XYZ January 35 and buy the XYZ April 35. A *diagonal spread* is any combination of vertical and horizontal and may involve calls that have different expiration dates as well as different striking prices. These three names that classify the spreads can be related to the way option prices are listed in any newspaper summary of closing option prices. A vertical spread involves two options from the same column in a newspaper listing. Newspaper columns run vertically. A horizontal spread involves two calls whose prices are listed in the same row in a newspaper listing; rows are horizontal. This relationship to the listing format in newspapers is not important, but it is an easy way to remember what vertical spreads and

horizontal spreads are. There are many types of vertical and horizontal spreads, and several of them are discussed in detail in later chapters.

SPREAD ORDER

The term "spread" designates not only a type of strategy, but a type of order as well. *All spread transactions in which both sides of the spread are opening (initial) transactions must be done in a margin account.* This means that the customer must generally maintain a minimum equity in the account, normally $2,000. Some brokerage houses may also have a maintenance requirement, or "kicker."

It *is* possible to transact a spread in a cash account, but one of the sides must be a closing transaction. In fact, many of the follow-up actions taken in the covered writing strategy are actually spread transactions. Suppose a covered writer is currently short one XYZ April call against 100 shares of the underlying stock. If he wants to roll forward to the July 35 call, he will be buying back the April 35 and selling the July 35 simultaneously. This is a spread transaction, technically, since one call is being bought and the other is being sold. However, in this transaction, the buy side is a closing transaction and the sell side is an opening transaction. This type of spread could be done in a cash account. Whenever a covered writer is rolling—up, down, or forward—he should place the order as a spread order to facilitate a better price execution.

The spreads discussed in the following chapters are predominantly spread strategies, ones in which both sides of the spread are opening transactions. These are designed to have their own profit and risk potentials, and are not merely follow-up actions to some previously discussed strategy.

When a spread order is entered, the options being bought and sold must be specified. Two other items must be specified as well: the price at which the spread is to be executed, and whether that price is a credit or a debit. If the total price of the spread results in a cash inflow to the spread strategist, the spread is a *credit spread*. This merely means that the sell side of the spread brings in a higher price than is paid for the buy side of the spread. If the reverse is true—that is, there is a cash outflow from the spread transaction—the spread is said to be a *debit spread*. This means that the buy side of the spread costs more than is received from the sell side. It is also common to refer to the purchased side of the spread as the *long side* and to refer to the written side of the spread as the *short side*.

The price at which a certain spread can be executed is generally *not* the difference between the last sale prices of the two options involved in the spread.

Example: An investor wants to buy an XYZ October 30 and simultaneously sell an XYZ October 35 call. If the last sale price of the October 30 was 4 points and the last sale price

of the October 35 was 2 points, it does not necessarily mean that the spread could be done for a 2-point debit (the difference in the last sale prices). In fact, *the only way to determine the market price for a spread transaction is to know what the bid and asked prices of the options involved are.* Suppose the following quotes are available on these two calls:

	Bid	Asked	Last Sale
October 30 call	3.90	4.10	4.00
October 35 call	1.95	2.00	2.00

Since the spread in question involves buying the October 30 call and selling the October 35, the spreader will, at market, have to pay 4.10 for the October 30 (the asked or offering quote) and will receive only 1.95 (the bid quote) for the October 35. This results in a debit of 2.15 points, significantly more than the 2-point difference in the last sale prices. Of course, one is free to specify any price he wants for any type of transaction. One might enter this spread order at a 2.10-point debit and could have a reasonable chance of having the order filled if the executing broker can do better than the bid side on the October 35 or better than the offering side on the October 30.

The point to be learned here is that *one cannot assume that last sale prices are indicative of the price at which a spread transaction can be executed.* This makes computer analysis of spread transactions via closing price data somewhat difficult. Some computer data services offer (generally at a higher cost) closing bid and asked prices as well as closing sale prices. If a strategist is forced to operate with closing prices only, however, he should attempt to build some screens into his output to allow for the fact that last sale prices might not be indicative of the price at which the spread can be executed. One simple method for screening is to look only at relatively liquid options—that is, those that have traded a substantial number of contracts during the previous trading day. If an option is experiencing a great deal of trading activity, there is a much better chance that the current quote is "tight," meaning that the bid and offering prices are quite close to the last sale price.

In the early days of listed options, it was somewhat common practice to "leg" into a spread. That is, the strategist would place separate buy and sell orders for the two transactions comprising his spread. As the listed markets have developed, adding depth and liquidity, *it is generally a poor idea to leg into a spread.* If the floor broker handling the transaction knows the entire transaction, he has a much better chance of "splitting a quote," buying on the bid, or selling on the offering. *Splitting a quote* merely means executing at a price that is between the current bid and asked prices. For example, if the bid is 3.90 and the offering is 4.10, a transaction at a price of 4 would be "splitting the quote."

The public customer must be aware that spread transactions may involve substantially higher commission costs, because there are twice as many calls involved in any one transaction. Some brokers offer slightly lower rates for spread transactions, but these are not nearly as low as spreads in commodity trading, for example.

The *bull spread* is one of the most popular forms of spreading. In this type of spread, one buys a call at a certain striking price and sells a call at a higher striking price. Generally, both options have the same expiration date. This is a vertical spread. *A bull spread tends to be profitable if the underlying stock moves up in price; hence, it is a bullish position.* The spread has both limited profit potential and limited risk. Although both can be substantial percentagewise, the risk can never exceed the net investment. In fact, a bull spread requires a smaller dollar investment and therefore has a smaller maximum dollar loss potential than does an outright call purchase of a similar call.

Example: The following prices exist:

XYZ common, 32;
XYZ October 30 call, 3; and
XYZ October 35 call, 1.

A bull spread would be established by buying the October 30 call and simultaneously selling the October 35 call. Assume that this could be done at the indicated 2-point debit. A *call bull spread is always a debit transaction,* since the call with the lower striking price must always trade for more than a call with a higher price, if both have the same expiration date. Table 7-1 and Figure 7-1 depict the results of this transaction at expiration. The indicated call profits or losses would be realized if the calls were liquidated at parity at expiration. Note that *the spread has a maximum profit and this profit is realized if the stock is anywhere above the higher striking price at expiration.* The maximum loss is realized if the stock is anywhere below the lower strike at expiration, and is equal to the net investment, 2 points in this example.

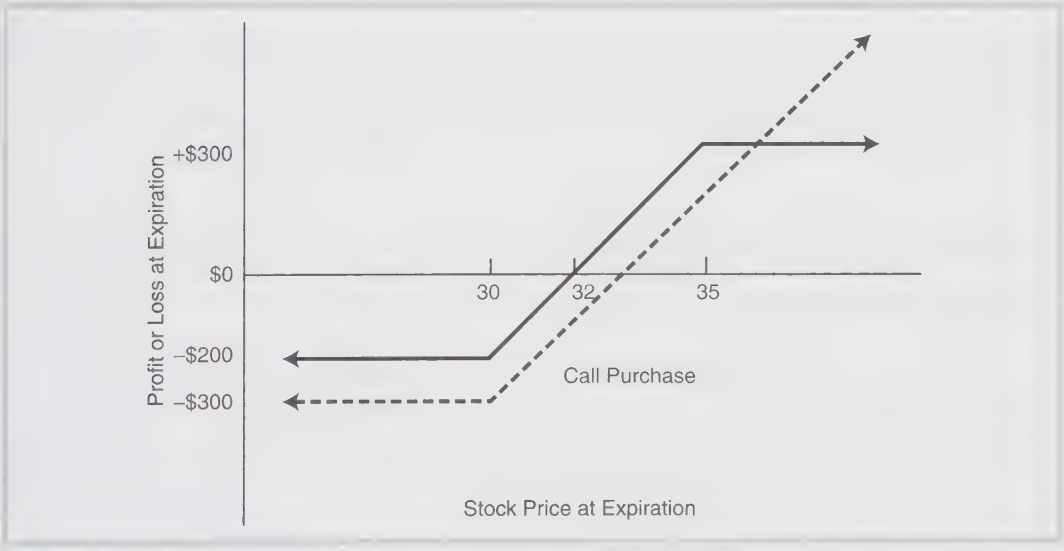
Moreover, there is a break-even point that always lies between the two striking prices at expiration. In this example, the break-even point is 32. All bull spreads have profit graphs with the same shape as the one shown in Figure 7-1 when the expiration dates are the same for both calls.

The investor who establishes this position is bullish on the underlying stock, but is generally looking for a way to hedge himself. If he were rampantly bullish, he would merely buy the October 30 call outright. However, the sale of the October 35 call against the purchase of the October 30 allows him to take a position that will outperform the outright purchase of the October 30, dollarwise, as long as the stock does not rise above 36 by expiration. This fact is demonstrated by the dashed line in Figure 7-1.

TABLE 7-1.
Results at expiration of bull spread.

XYZ Price at Expiration	October 30 Profit	October 35 Profit	Total Profit
25	– $300	+$100	–$200
30	– 300	+ 100	– 200
32	– 100	+ 100	0
35	+ 200	+ 100	+ 300
40	+ 700	– 400	+ 300
45	+ 1,200	– 900	+ 300

FIGURE 7-1.
Bull spread.



Therefore, the strategist establishing the bull spread is bullish, but not overly so. To verify that this comparison is correct, note that if one bought the October 30 call outright for 3 points, he would have a 3-point profit at expiration if XYZ were at 36. Both strategies have a 3-point profit at 36 at expiration. Below 36, the bull spread does better because the sale of the October 35 call brings in the extra point of premium. Above 36 at expiration, the outright purchase outperforms the bull spread, because there is no limit on the profits that can occur in an outright purchase situation.

The net investment required for a bull spread is the net debit plus commissions. Since the spread must be transacted in a margin account, there will generally be a minimum

equity requirement imposed by the brokerage firm. In addition, there may be a maintenance requirement by some brokers. Suppose that one was establishing 10 spreads at the prices given in the example above. His investment, before commissions, would be $2,000 ($200 per spread), plus commissions. It is a simple matter to compute the break-even point and the maximum profit potential of a call bull spread:

$$\text{Break-even point} = \text{Lower striking price} + \text{Net debit of spread}$$

$$\text{Maximum profit potential} = \text{Higher striking price} - \text{Lower striking price} - \text{Net debit of spread}$$

In the example above, the net debit was 2 points. Therefore, the break-even point would be 30 + 2, or 32. The maximum profit potential would be 35 – 30 – 2, or 3 points. These figures agree with Table 7-1 and Figure 7-1. *Commissions may represent a significant percentage of the profit and net investment*, and should therefore be calculated before establishing the position. If these commissions are included in the net debit to establish the spread, they conveniently fit into the preceding formulae. Commission charges can be reduced percentagewise by spreading a large quantity of calls. For this reason, it is generally advisable to spread at least 5 options at a time.

DEGREES OF AGGRESSIVENESS

AGGRESSIVE BULL SPREAD

Depending on how the bull spread is constructed, it may be an extremely aggressive or more conservative position. The most commonly used bull spread is of the *aggressive* type; the stock is generally well below the higher striking price when the spread is established. This aggressive bull spread generally has the ability to generate substantial percentage returns if the underlying stock should rise in price far enough by expiration. *Aggressive bull spreads are most attractive when the underlying common stock is relatively close to the lower striking price at the time the spread is established.* A bull spread established under these conditions will generally be a low-cost spread with substantial profit potential, even after commissions are included.

EXTREMELY AGGRESSIVE BULL SPREAD

An extremely aggressive type of bull spread is the "out-of-the-money" spread. In such a spread, *both* calls are out-of-the-money when the spread is established. These spreads are extremely inexpensive to establish and have large potential profits if the stock should

climb to the higher striking price by expiration. However, they are usually quite deceptive in nature. The underlying stock has only a relatively remote chance of advancing such a great deal by expiration, and the spreader could realize a 100% loss of his investment even if the underlying stock advances moderately, since both calls are out-of-the-money. This spread is akin to buying a deeply out-of-the-money call as an outright speculation. It is not recommended that such a strategy be pursued with more than a very small percentage of one's speculative funds.

LEAST AGGRESSIVE BULL SPREAD

Another type of bull spread can be found occasionally—the "in-the-money" spread. In this situation, both calls are in-the-money. This is a much less aggressive position, since it offers a large probability of realizing the maximum profit potential, although that profit potential will be substantially smaller than the profit potentials offered by the more aggressive bull spreads.

Example: XYZ is at 37 some time before expiration, and the October 30 call is at 7 while the October 35 call is at 4. Both calls are in-the-money and the spread would cost 3 points (debit) to establish. The maximum profit potential is 2 points, but it would be realized as long as XYZ were above 35 at expiration. That is, XYZ could *fall* by 2 points and the spreader would still make his maximum profit. This is certainly a more conservative position than the aggressive spread described above. The commission costs in this spread would be substantially larger than those in the spreads above, which involve less expensive options initially, and they should therefore be figured into one's profit calculations before entering into the spread transaction. Since this stock would have to decline 7 points to fall below 30 and cause a loss of the entire investment, it would have to be considered a rather low-probability event. This fact adds to the less aggressive nature of this type of spread.

RANKING BULL SPREADS

To accurately compare the risk and reward potentials of the many bull spreads that are available in a given day, one has to use a computer to perform the mass calculations. It is possible to use a strictly arithmetic method of ranking bull spreads, but such a list will not be as accurate as the correct method of analysis. In reality, it is necessary to incorporate the volatility of the underlying stock, and possibly the expected return from the spread as well, into one's calculations. The concept of expected return is described in detail in Chapter 28, where a bull spread is used as an example.

The exact method for using volatility and predicting an option's price after an upward movement are presented later. Many data services offer such information. However, if the reader wants to attempt a simpler method of analysis, the following one may suffice. In any ranking of bull spreads, *it is important not to rank the spreads by their maximum potential profits at expiration*. Such a ranking will always give the most weight to deeply out-of-the-money spreads, which can rarely achieve their maximum profit potential. It would be better to screen out any spreads whose maximum profit prices are too far away from the current stock price. A simple method of allowing for a stock's movement might be to assume that the stock could, at expiration, advance by an amount equal to twice the time value premium in an at-the-money call. Since more volatile stocks have options with greater time value premium, this is a simple attempt to incorporate volatility into the analysis. Also, since longer-term options have more time value premium than do short-term options, this will allow for larger movements during a longer time period. Percentage returns should include commission costs. This simple analysis is not completely correct, but it may prove useful to those traders looking for a simple arithmetic method of analysis that can be computed quickly.

FURTHER CONSIDERATIONS

The bull spreads described in previous examples utilize the same expiration date for both the short call and the long call. It is sometimes useful to buy a call with a longer time to maturity than the short call has. Such a position is known as a diagonal bull spread and is discussed in a later chapter.

Experienced traders often turn to bull spreads when options are expensive. The sale of the option at the higher strike partially mitigates the cost of buying an expensive option at the lower strike. However, one should not always use the bull spread approach just because the options have a lot of time value premium, for he would be giving up a lot of upside profit potential in order to have a hedged position.

With most types of spreads, it is necessary for some time to pass for the spread to become significantly profitable, even if the underlying stock moves in favor of the spreader. For this reason, *bull spreads are not for traders* unless the options involved are very short-term in nature. If a speculator is bullishly oriented for a short-term upward move in an underlying stock, it is generally better for him to buy a call outright than to establish a bull spread. Since the spread differential changes mainly as a function of time, small movements in price by the underlying stock will not cause much of a short-term change in the price of the spread. However, the bull spread has a distinct advantage over the purchase of a call if the underlying stock advances moderately *by expiration*.

In the previous example, a bull spread was established by buying the XYZ October 30 call for 3 points and simultaneously selling the October 35 call for 1 point. This spread

can be compared to the outright purchase of the XYZ October 30 alone. There is a short-term advantage in using the outright purchase.

Example: The underlying stock jumps from 32 to 35 in one day's time. The October 30 would be selling for approximately 5.50 if that happened, and the outright purchaser would be ahead by 2.50 points, less one option commission. The long side of the bull spread would do as well, of course, since it utilizes the same option, but the short side, the October 35, would probably be selling for about 2.50. Thus, the bull spread would be worth 3 points in total (5.50 on the long side, less 2.50 loss on the short side). This represents a 1-point profit to the spreader, less two option commissions, since the spread was initially established at a debit of 2 points. Clearly, then, for the shortest time period—one day—the outright purchase outperforms the bull spread on a quick rise.

For a slightly longer time period, such as 30 days, the outright purchase still has the advantage if the underlying stock moves up quickly. Even if the stock should advance above 35 in 30 days, the bull spread will still have time premium in it and thus will not yet have reached its maximum spread potential of 5 points. Recall that the maximum potential of a bull spread is always equal to the difference between the striking prices. Clearly, the outright purchaser will do very well if the underlying stock should advance that far in 30 days' time. When risk is considered, however, it must be pointed out that the bull spread has fewer dollars at risk and, if the underlying stock should drop rather than rise, the bull spread will often have a smaller loss than the outright call purchase would.

The longer it takes for the underlying stock to advance, the more the advantage swings to the spread. Suppose XYZ does not get to 35 until expiration. In this case, the October 30 call would be worth 5 points and the October 35 call would be worthless. The outright purchase of the October 30 call would make a 2-point profit less one commission, but the spread would now have a 3-point profit, less two commissions. Even with the increased commissions, the spreader will make more of a profit, both dollarwise and percentagewise.

Many traders are disappointed with the low profits available from a bull spread when the stock rises almost immediately after the position is established. One way to partially offset the problem with the spread not widening out right away is to use a greater distance between the two strikes. When the distance is great, the spread has room to widen out, even though it won't reach its maximum profit potential right away. Still, since the strikes are "far apart," there is more room for the spread to widen even if the underlying stock rises immediately.

The conclusion that can be drawn from these examples is that, in general, the outright purchase is a better strategy if one is looking for a quick rise by the underlying stock. Overall, the bull spread is a less aggressive strategy than the outright purchase of a call.

The spread will not produce as much of a profit on a short-term move, or on a sustained, large upward move. It will, however, outperform the outright purchase of a call if the stock advances slowly and moderately by expiration. Also, the spread always involves fewer actual dollars of risk, because it requires a smaller debit to establish initially. Table 7-2 summarizes which strategy has the upper hand for various stock movements over differing time periods.

TABLE 7-2.
Bull spread and outright purchase compared.

	If the underlying stock . . .			
	Declines	Remains Relatively Unchanged	Advances Moderately	Advances Substantially
in . . .				
1 week	Bull spread	Bull spread	Outright purchase	Outright purchase
1 month	Bull spread	Bull spread	Outright purchase	Outright purchase
At expiration	Bull spread	Bull spread	Bull spread	Outright purchase

FOLLOW-UP ACTION

Since the strategy has both limited profit and limited risk, it is not mandatory for the spreader to take any follow-up action prior to expiration. If the underlying stock advances substantially, the spreader should watch the time value premium in the short call closely in order to close the spread if it appears that there is a possibility of assignment. This possibility would increase substantially if the time value premium disappeared from the short call. If the stock falls, the trader may want to close the spread in order to limit his losses even further.

When the spread is closed, the order should also be entered as a spread transaction. If the underlying stock has moved up in price, the order to liquidate would be a *credit* spread involving two closing transaction. *The maximum credit that can be recovered from a bull spread is an amount equal to the difference between the striking prices.* In the previous example, if XYZ were above 35 at expiration, one might enter an order to liquidate the spread as follows: Buy the October 35 (it is common practice to specify the buy side of a spread first when placing an order); sell the October 30 at a 5-point credit. In reality, because of the difference between bids and offers, it is quite difficult to obtain the entire 5-point credit even if expiration is quite near. Generally, one might ask for a 4.80 or 4.90 credit. It is possible to close the spread via exercise, although this method is normally advisable only for traders who pay little or no commissions. If the short side of a

spread is assigned, the spreader may satisfy the assignment notice by exercising the long side of his spread. There is no margin required to do so, but there are stock commissions involved. Since these stock commissions to a public customer would be substantially larger than the option commissions involved in closing the spread by liquidating the options, *it is recommended that the public customer attempt to liquidate rather than exercise.*

A minor point should be made here. Since the amount of commissions paid to liquidate the spread would be larger if higher call prices are involved, the actual net maximum profit point for a bull spread is for the stock to be exactly at the higher striking price at expiration. If the stock exceeds the higher striking price by a great deal, the gross profit will be the same (it was demonstrated earlier that this gross profit is the same anywhere above the higher strike at expiration), but the net profit will be slightly smaller, since the investor will pay more in commissions to liquidate the spread.

Some spreaders prefer to buy back the short call if the underlying stock drops in price, in order to lock in the profit on the short side. They will then hold the long call in hopes of a rise in price by the underlying stock, in order to make the long side of the spread profitable as well. This amounts to "legging" out of the spread, although the overall increase in risk is small—the amount paid to repurchase the short call. If he attempts to "leg" out of the spread in such a manner, the spreader should not attempt to buy back the short call at too high a price. If it can be repurchased at ⅛; or 1/16, the spreader will be giving away virtually nothing by buying back the short call. However, he should not be quick to repurchase it if it still has much more value than that, unless he is closing out the entire spread. At no time should one attempt to "leg" out after a stock price increase, taking the profit on the long side and hoping for a stock price decline to make the short side profitable as well. The risk is too great.

Many traders find themselves in the somewhat perplexing situation of having seen the underlying make a large, quick move, only to find that their spread has not widened out much. They often try to figure out a way to perhaps lock in some gains in case the underlying subsequently drops in price, but they want to be able to wait around for the spread to widen out more toward its maximum profit potential. There really isn't any hedge that can accomplish all of these things. The only position that can lock in the profits in a call bull spread is to purchase the accompanying *put* bear spread. This strategy is discussed in Chapter 23, Spreads Combining Calls and Puts.

OTHER USES OF BULL SPREADS

Superficially, the bull spread is one of the simplest forms of spreading. However, it can be an extremely useful tool in a wide variety of situations. Two such situations were described in Chapter 3. If the outright purchaser of a call finds himself with an unrealized loss, he

may be able to substantially improve his chances of getting out even by "rolling down" into a bull spread. If, however, he has an unrealized profit, he may be able to sell a call at the next higher strike, creating a bull spread, in an attempt to lock in some of his profit.

In a somewhat similar manner, a common stockholder who is faced with an unrealized loss may be able to utilize a bull spread to lower the price at which he can break even. He may often have a significantly better chance of breaking even or making a profit by using options. The following example illustrates the stockholder's strategy.

Example: An investor buys 100 shares of XYZ at 48, and later finds himself with an unrealized loss with the stock at 42. A 6-point rally in the stock would be necessary in order to break even. However, if XYZ has listed options trading, he may be able to significantly reduce his break-even price. The prices are:

XYZ common, 42;
XYZ October 40, 4; and
XYZ October 45, 2.

The stock owner could enhance his overall position by buying one October 40 call and selling *two* October 45 calls. Note that no extra money, except commissions, is required for this transaction, because the credit received from selling two October 45's is $400 and is equal to the cost of buying the October 40 call. However, maintenance and equity requirements still apply, because a spread has been established.

The resulting position does not have an uncovered, or naked, option in it. One of the October 45 calls that was sold is covered by the underlying stock itself. The other is part of a bull spread with the October 40 call. It is not particularly important that the resulting position is a combination of both a bull spread and a covered write. What is important is the profit characteristic of this new total position.

If XYZ should continue to decline in price and be below 40 at October expiration, all the calls will expire worthless, and the resulting loss to the stock owner will be the same (except for the option commissions spent) as if he had merely held onto his stock without having done any option trading.

Since both a covered write and a bull spread are strategies with limited profit potential, *this new position obviously must have a limited profit.* If XYZ is anywhere above 45 at October expiration, the maximum profit will be realized. To determine the size of the maximum profit, assume that XYZ is at exactly 45 at expiration. In that case, the two short October 45's would expire worthless and the long October 40 call would be worth 5 points. The option trades would have resulted in a $400 profit on the short side ($200 from each October 45 call) plus a $100 profit on the long side, for a total profit of $500 from the

option trades. Since the stock was originally bought at 48 in this example, the stock portion of the position is a $300 loss with XYZ at 45 at expiration. The overall profit of the position is thus $500 less $300, or $200.

For stock prices between 40 and 45 at expiration, the results are shown in Table 7-3 and Figure 7-2. Figure 7-2 depicts the two columns from the table labeled "Profit on Stock" and "Total Profit," so that one can visualize how the new total position compares with the original stockholder's profit. Several points should be noted from either the graph or the table. First, the break-even point is lowered from 48 to 44. The new total position breaks even at 44, so that only a 2-point rally by the stock by expiration is necessary in order to break even. The two strategies are equal at 50 at expiration. That is, the stock would have to rally more than 8 points, from 42 to 50, by expiration for the original stockholder's position to outperform the new position. Below 40, the two strategies produce the same result. Finally, between 40 and 50, the new position outperforms the original stockholder's position.

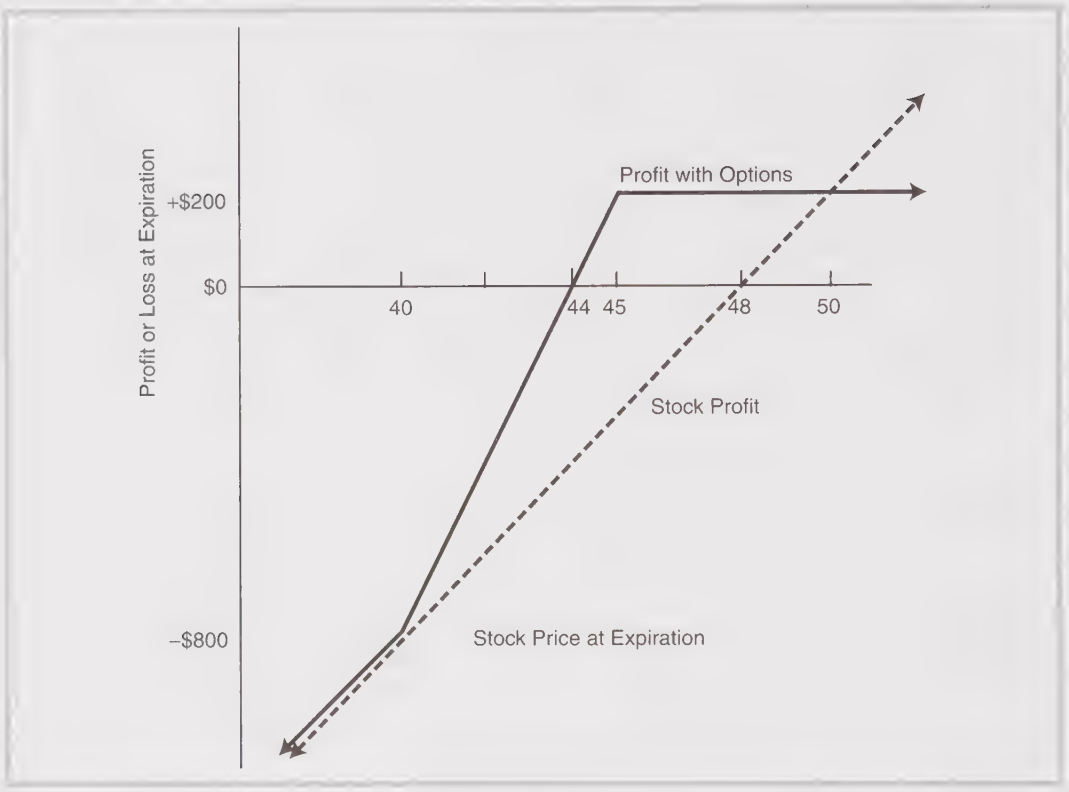
In summary, then, the stockholder stands to gain much and gives away very little by adding the indicated options to his stock position. If the stock stabilizes at all—anywhere between 40 and 50 in the example above—the new position would be an improvement. Moreover, the investor can break even or make profits on a small rally. If the stock continues to drop heavily, nothing additional will be lost except for option commissions. Only if the stock rallies very sharply will the stock position outperform the total position.

This strategy—combining a covered write and a bull spread—is sometimes used as an initial (opening) trade as well. That is, an investor who is considering buying XYZ at 42

TABLE 7-3.
Lowering the break-even price on common stock.

XYZ Price at Expiration	Profit on Stock	Profit on Short October 45's	Profit on Long October 40	Total Profit
35	–$1,300	+$400	–$400	–$1,300
38	– 1,000	+ 400	– 400	– 1,000
40	– 800	+ 400	– 400	– 800
42	– 600	+ 400	– 200	– 400
43	– 500	+ 400	– 100	– 200
44	– 400	+ 400	0	0
45	– 300	+ 400	+ 100	+ 200
48	0	– 200	+ 400	+ 200
50	+ 200	– 600	+ 600	+ 200

FIGURE 7-2.
Lowering the break-even price on common stock.



might decide to buy the October 40 and sell two October 45's (for even money) at the outset. The resulting position would not be inferior to the outright purchase of XYZ stock, in terms of profit potential, unless XYZ rose above 46 by October expiration.

Bull spreads may also be used as a "substitute" for covered writing. Recall from Chapter 2 that writing against warrants can be useful because of the smaller investment required, especially if the warrant was in-the-money and was not selling at much of a premium. The same thinking applies to call options. *If there is an in-the-money call with little or no time premium remaining in it, its purchase may be used as a substitute for buying the stock itself.* Of course, the call will expire, whereas the stock will not; but the profit potential of owning a deeply in-the-money call can be very similar to owning the stock. Since such a call costs less to purchase than the stock itself would, the buyer is getting essentially the same profit or loss potential with a smaller investment. It is natural, then, to think that one might write another call—one closer to the money—against the

deeply in-the-money purchased call. This position would have profit characteristics much like a covered write, since the long call "simulates" the purchase of stock. This position really is, of course, a bull spread, in which the purchased call is well in-the-money and the written call is closer to the money. Clearly, one would not want to put all of his money into such a strategy and forsake covered writing, since, with bull spreads, he could be entirely wiped out in a moderate market decline. In a covered writing strategy, one still owns the stocks even after a severe market decline. However, one may achieve something of a compromise by investing a much smaller amount of money in bull spreads than he might have invested in covered writes. He can still retain the same profit potential. The balance of the investor's funds could then be placed in interest-bearing securities.

Example: The following prices exist:

XYZ common, 49;
XYZ April 50 call, 3; and
XYZ April 35 call, 14.

Since the deeply in-the-money call has no time premium, its purchase will perform much like the purchase of the stock until April expiration. Table 7-4 summarizes the profit potential from the covered write or the bull spread. The profit potentials are the same from a cash covered write or the bull spread. Both would yield a $400 profit before commissions if XYZ were above 50 at April expiration. However, since the bull spread requires a much smaller investment, the spreader could put $3,500 into interest-bearing securities. This interest could be considered the equivalent of receiving the dividends on the stock. In any case, the spreader can lose only $1,100, even if the stock declines substantially. The covered writer could have a larger unrealized loss than that if XYZ were below 35 at expiration. Also, in the bull spread situation, the writer can "roll down" the April 50 call if the stock declines in price, just as he might do in a covered writing situation.

TABLE 7-4.
Results for covered write and bull spread compared.

	Covered Write: Buy XYZ and Sell April 50 Call	Bull Spread: Buy XYZ April 35 Call and Sell April 50 Call
Maximum profit potential (stock over 50 in April)	$ 400	$ 400
break-even point	46	46
Investment	$4,600	$1,100

Thus, the bull spread offers the same dollar rewards, the same break-even point, smaller commission costs, less potential risk, and interest income from the fixed-income portion of the investment. While it is not always possible to find a deeply in-the-money call to use as a "substitute" for buying the stock, when one does exist, the strategist should consider using the bull spread instead of the covered write.

SUMMARY

The bull spread is one of the simplest and most popular forms of spreading. It will generally perform best in a moderately bullish environment. A bull spread will not widen out to its maximum profit potential right away, though; so for short-term trades, the outright purchase of a call is a better choice. The bull spread can also be applied for more sophisticated purposes in a far wider range of situations than merely wanting to attempt to capitalize on a moderate advance by the underlying stock. Both call buyers and stock buyers may be able to use bull spreads to "roll down" and produce lower break-even points for their positions. The covered writer may also be able to use bull spreads as a substitute for covered writes in certain situations in which a deeply in-the-money call exists.

CHAPTER 8

Bear Spreads Using Call Options

Options are versatile investment vehicles. For every type of bullish position that can be established, there is normally a corresponding bearish type of strategy. For every neutral strategy, there is an aggressive strategy for the investor with an opposite opinion. One such case has already been explored in some detail; the synthetic straddle buy (or reverse hedge) is the opposite of a ratio write. For many of the strategies to be described from this point on, there is a corresponding strategy designed for the strategist with the opposite point of view. In this vein, a bear spread is the opposite of a bull spread.

THE BEAR SPREAD

In a call bear spread, one buys a call at a certain striking price and sells a call at a lower striking price. This is a vertical spread, as was the bull spread. The bear spread tends to be profitable if the underlying stock declines in price. Like the bull spread, it has limited profit and loss potential. However, unlike the bull spread, the bear spread is a *credit* spread when the spread is set up with call options. Since one is selling the call with the lower strike, and a call at a lower strike always trades at a higher price than a call at a higher strike with the same expiration, the bear spread must be a credit position. It should be pointed out that most bearish strategies that can be established with call options may be more advantageously constructed using put options. Many of these same strategies are therefore discussed again in Part III.

Example: An investor is bearish on XYZ. Using the same prices that were used for the examples in Chapter 7, an example of a bear spread can be constructed for:

XYZ common, 32;
XYZ October 30 call, 3; and
XYZ October 35 call, 1.

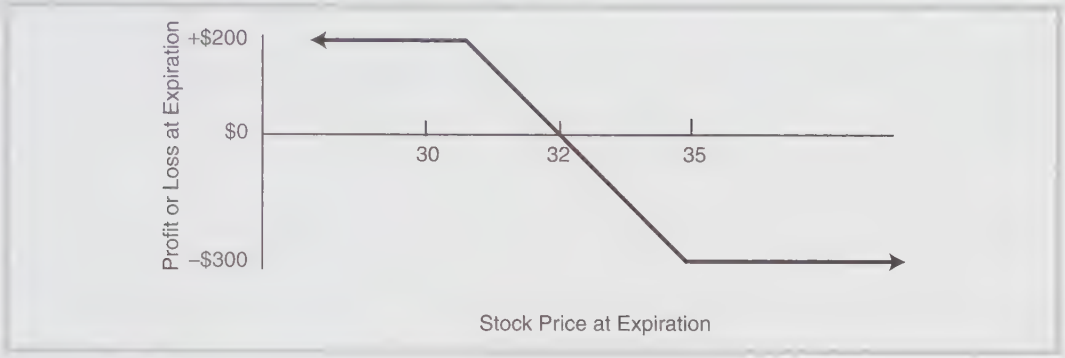
A bear spread would be established by buying the October 35 call and selling the October 30 call. This would be done for a 2-point credit, before commissions. *In a bear spread situation, the strategist is hoping that the stock will drop in price and that both options will expire worthless.* If this happens, he will not have to pay anything to close his spread; he will profit by the entire amount of the original credit taken in. In this example, then, the maximum profit potential is 2 points, since that is the amount of the initial credit. This profit would be realized if XYZ were anywhere below 30 at expiration, because both options would expire worthless in that case.

If the spread expands in price, rather than contracts, the bear spreader will be losing money. This expansion would occur in a rising market. The maximum amount that this spread could expand to is 5 points—the difference between the striking prices. Hence, the most that the bear spreader would have to pay to buy back this spread would be 5 points, resulting in a maximum potential loss of 3 points. This loss would be realized if XYZ were anywhere above 35 at October expiration. Table 8-1 and Figure 8-1 depict the actual profit and loss potential of this example at expiration (commissions are not included). The astute reader will note that the figures in the table are exactly the reverse of those shown for the bull spread example in Chapter 7. Also, the profit graph of the bear spread looks like a bull spread profit graph that has been turned upside down. All bear spreads have a profit graph with the same shape at expiration as the graph shown in Figure 8-1.

TABLE 8-1.
Bear spread.

XYZ Price at Expiration	October 30 Profit	October 35 Profit	Total Profit
25	+$300	–$100	+$200
30	+ 300	– 100	+ 200
32	+ 100	– 100	0
35	– 200	– 100	– 300
40	– 700	+ 400	– 300

FIGURE 8-1.
Bear spread.



The break-even point, maximum profit potential, and investment required are all quite simple computations for a bear spread.

Maximum profit potential = Net credit received

Break-even point = Lower striking price + Amount of credit

$$\text{Maximum risk} = \text{Collateral investment required} = \text{Difference in striking prices} - \text{Credit received} + \text{Commissions}$$

In the example above, the net credit received from the sale of the October 30 call at 3 and the purchase of the October 35 call at 1 was two points. This is the maximum profit potential. The break-even point is then easily computed as the lower striking price, 30, plus the amount of the credit, 2, or 32. The risk is equal to the investment. It is the difference between the striking prices—5 points—less the net credit received—2 points—for a total investment of 3 points plus commissions. Since this spread involves a call that is not "covered" by a long call with a striking price equal to or lower than that of the short call, some brokerage firms may require a higher maintenance requirement per spread than would be required for a bull spread. Again, since a spread must be done in a margin account, most brokerage firms require that a minimum amount of equity be in the account as well.

Since this is a credit spread, the investor does not really "spend" any dollars to establish the spread. The investment is really a reduction in the buying power of the customer's margin account, but it does not actually require dollars to be spent when the transaction is initiated.

SELECTING A BEAR SPREAD

Depending on where the underlying stock is trading with respect to the two striking prices, the bear spread may be very aggressive, with a high profit potential, or it may be less aggressive, with a low profit potential. If a large credit is initially taken in, there is obviously the potential for a good deal of profit. However, for the spread to take in a large credit, the underlying stock must be well above the lower striking price. This means that a relatively substantial downward move would be necessary in order for the maximum profit potential to be realized. Thus, *a large credit bear spread is usually an aggressive position;* the spreader needs a substantial move by the underlying stock in order to make his maximum profit. The probabilities of this occurring cannot be considered large.

A less aggressive type of bear spread is one in which the underlying stock is actually *below* the lower striking price when the spread is established. The credit received from establishing a bear spread in such a situation would be small, but the spreader would realize his maximum profit even if the underlying stock remained unchanged or actually rose slightly in price by expiration.

Example: XYZ is trading at a price of 25. The October 30 call might be sold for 1.50 points and the October 35 call bought for .50 with the stock at 29. While the net credit, and hence the maximum profit potential, is a small dollar amount, 1 point, it will be realized even if XYZ rises slightly by expiration, as long as it does not rise above 30.

It is not always clear which type of spread is better, the large credit bear spread or the small credit bear spread. One has a small probability of making a large profit and the other has a much larger probability of making a much smaller profit. In general, *bear spreads established when the underlying stock is closer to the lower striking price will be the best ones.* To see this, note that if a bear spread is initiated when the stock is at the higher striking price, the spreader is selling a call that has mostly intrinsic value and little time value premium (since it is in-the-money), and is buying a call that is nearly all time value. This is just the opposite of what the option strategist should be attempting to do. *The basic philosophy of option strategy is to sell time value and buy intrinsic value.* For this reason, the large credit bear spread is not an optimum strategy. It will be interesting to observe later that bear spreads with puts are more attractive when the underlying stock is at the higher striking price!

A bear spread will not collapse right away, even if the underlying stock drops in price. This is somewhat similar to the effect that was observed with the call bull spreads in Chapter 7. They, too, do not accelerate to their maximum profit potential right away. Of course, as time winds down and expiration approaches, *then* the spread will approach its maximum profit potential. This is important to understand because, if one is expecting

a quick move down by the underlying stock, he might need to use a call bear spread in which the lower strike is actually somewhat deeply in-the-money, while the upper strike is out-of-the-money. In this case, the in-the-money call will decline in value as the stock moves down, even if that downward move happens immediately. Meanwhile, the out-of-the-money long call protects against a disastrous upside breakout by the stock. This type of bear spread is really akin to selling a deep in-the-money call for its raw downside profit potential and buying an out-of-the-money call merely as disaster insurance.

FOLLOW-UP ACTION

Follow-up strategies are not difficult, in general, for bear spreads. The major thing that the strategist must be aware of is impending assignment of the short call. If the short side of the spread is in-the-money and has no time premium remaining, the spread should be closed regardless of how much time remains until expiration. This disappearance of time value premium could be caused either by the stock being significantly above the striking price of the stock call, or by an impending dividend payment. In either case, the spread should be closed to avoid assignment and the resultant large commission costs on stock transactions. Note that the large credit bear spread (one established with the stock well above the lower striking price) is dangerous from the viewpoint of early assignment, since the time value premium in the call will be small to begin with.

SUMMARY

The call bear spread is a bearishly oriented strategy. Since the spread is a credit spread, requiring only a reduction in buying power but no actual layout of cash to establish, it is a moderately popular strategy. The bear spread using calls may not be the optimum type of bearish spread that is available; a bear spread using put options may be.

CHAPTER 9

Calendar Spreads

A *calendar spread,* also frequently called a *time spread,* involves the sale of one option and the simultaneous purchase of a more distant option, both with the same striking price. In the broad definition, the calendar spread is a horizontal spread. The neutral philosophy for using calendar spreads is that time will erode the value of the near-term option at a faster rate than it will the far-term option. If this happens, the spread will widen and a profit may result at near-term expiration. With call options, one may construct a more aggressive, bullish calendar spread. Both types of spreads are discussed.

Example: The following prices exist sometime in late January:

	April 50 Call (3-month call)	July 50 Call (6-month call)	October 50 Call (9-month call)
XYZ: 50	5	8	10

If one sells the April 50 call and buys the July 50 at the same time, he will pay a debit of 3 points—the difference in the call prices—plus commissions. That is, *his investment is the net debit of the spread plus commissions.* Furthermore, suppose that in 3 months, at April expiration, XYZ is unchanged at 50. Then the 3-month call should be worth 5 points, and the 6-month call should be worth 8 points, as they were previously, all other factors being equal.

	April 50 Call (Expiring)	July 50 Call (3-month call)	October 50 Call (6-month call)
XYZ: 50	0	5	8

The spread between the April 50 and the July 50 has now widened to 5 points. Since the spread cost 3 points originally, this widening effect has produced a 2-point profit. The spread could be closed at this time in order to realize the profit, or the spreader may decide to continue to hold the July 50 call that he is long. By continuing to hold the July 50 call, he is risking the profits that have accrued to date, but he could profit handsomely if the underlying stock rises in price over the next 3 months, before July expiration.

It is not necessary for the underlying stock to be exactly at the striking price of the options at near-term expiration for a profit to result. In fact, some profit can be made in a range that extends both below and above the striking price. The risk in this type of position is that the stock will drop a great deal or rise a great deal, in which case the spread between the two options will shrink and the spreader will lose money. Since the spread between two calls at the same strike cannot shrink to less than zero, however, *the risk is limited to the amount of the original debit spent to establish the spread, plus commissions.*

THE NEUTRAL CALENDAR SPREAD

As mentioned earlier, the calendar spreader can either have a neutral outlook on the stock or he can construct the spread for an aggressively bullish outlook. The neutral outlook is described first. The calendar spread that is established when the underlying stock is at or near the striking price of the options used is a neutral spread. The strategist is interested in selling time and not in predicting the direction of the underlying stock. If the stock is relatively unchanged when the near-term option expires, the neutral spread will make a profit. *In a neutral spread, one should initially have the intent of closing the spread by the time the near-term option expires.*

Let us again turn to our example calendar spread described earlier in order to more accurately demonstrate the potential risks and rewards from that spread when the near-term, April, call expires. To do this, it is necessary to estimate the price of the July 50 call at that time. Notice that, with XYZ at 50 at expiration, the results agree with the less detailed example presented earlier. The graph shown in Figure 9-1 is the "total profit" from Table 9-1. The graph is a curved rather than straight line, since the July 50 call still has time premium. There is a slightly bullish bias to this graph: The profit range extends slightly farther above the striking price than it does below the striking price. This is due to the fact that the spread is a call spread. If puts had been used, the profit range would have a bearish bias. The total width of the profit range is a function of the volatility of the underlying stock, since that will determine the price of the remaining long call at expiration, as well as a function of the time remaining to near-term expiration.

FIGURE 9-1.
Calendar spread at near-term expiration.

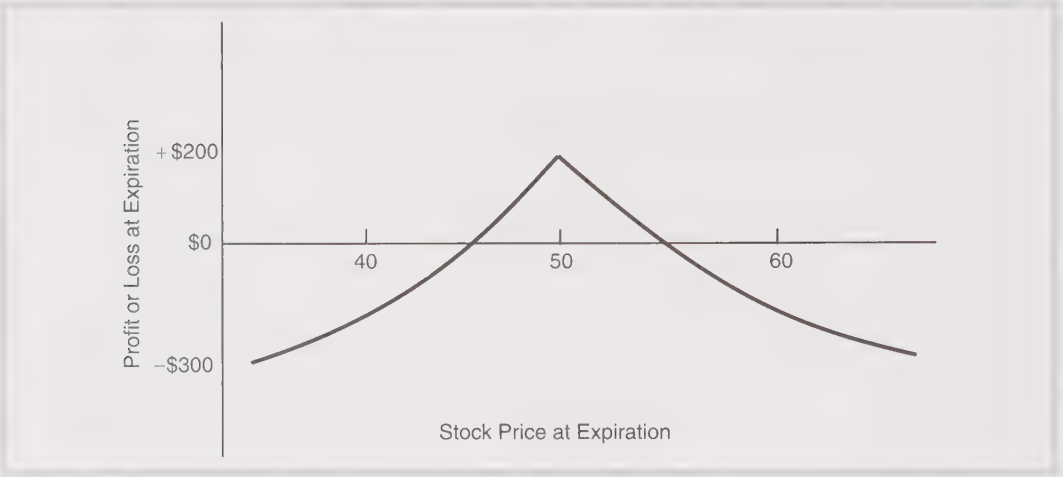


TABLE 9-1.
Estimated profit or losses at April expiration.

XYZ Stock Price	April 50 Price	April 50 Profit	July 50 Price	July 50 Profit	Total Profit
40	0	+$500	.50	–$750	–$250
45	0	+ 500	2.50	– 550	– 50
48	0	+ 500	4	– 400	+ 100
50	0	+ 500	5	– 300	+ 200
52	2	+ 300	6	– 200	+ 100
55	5	0	8	0	0
60	10	– 500	10.50	+ 250	– 250

Table 9-1 and Figure 9-1 clearly depict several of the more significant aspects of the calendar spread. *There is a range within which the spread is profitable at near-term expiration.* That range would appear to be about 46 to 55 in the example. Outside that range, losses can occur, but they are limited to the amount of the initial debit. Notice in the example that the stock would have to be well below 40 or well above 60 for the maximum loss to occur. Even if the stock is at 40 or 60, there is some time premium left in the longer-term option, and the loss is not quite as large as the maximum possible loss of $300.

This type of calendar spread has limited profits and relatively large commission costs. It is generally best to establish such a spread 8 to 12 weeks before the near-term

option expires. If this is done, one is capitalizing on the maximum rate of decay of the near-term option with respect to the longer-term option. That is, when a call has less than 8 weeks of life, the rate of decay of its time value premium increases substantially with respect to the longer-term options on the same stock.

THE EFFECT OF VOLATILITY

The implied volatility of the options (and hence the actual volatility of the underlying stock) will have an effect on the calendar spread. *As volatility increases, the spread widens; as volatility contracts, the spread shrinks.* This is important to know. In effect, buying a calendar spread is an *antivolatility* strategy: One wants the underlying to remain somewhat unchanged. Sometimes, calendar spreads look especially attractive when the underlying stock is volatile. However, this can be misleading for two reasons. First of all, since the stock is volatile, there is a greater chance that it will move outside of the profit area. Second, if the stock *does* stabilize and trades in a range near the striking price, the spread will *lose* value because of the decrease in volatility. That loss may be greater than the gain from time decay!

FOLLOW-UP ACTION

Ideally, the spreader would like to have the stock be just below the striking price when the near-term call expires. The spreader would also ideally like the implied volatility of the remaining long call option to be as high as possible, for that will increase the price of the call. If this happens, he can close the spread with only one commission cost, that of selling out the long call, although most traders would close out both sides near the close of the day on expiration day, so that the long call would not have to be held over the weekend—and therefore exposed to a downward gap in the underlying stock on Monday morning. If the calls are in-the-money at the expiration date, he will, of course, have to pay two commissions to close the spread. As with all spread positions, the order to close the spread should be placed as a single order. "Legging" out of a spread is highly risky and is not recommended.

Prior to expiration, the spreader should close the spread if the near-term short call is trading at parity. He does this to avoid assignment. Being called out of spread position is devastating from the viewpoint of the stock commissions involved for the public customer. The near-term call would not normally be trading at parity until quite close to the last day of trading, unless the stock has undergone a substantial rise in price.

In the case of an early *downside* breakout by the underlying stock, the spreader has several choices. He could immediately close the spread and take a small loss on the

position. Another choice is to leave the spread alone until the near-term call expires and then to hope for a partial recovery from the stock in order to be able to recover some value from the long side of the spread. Such a holding action is often better than the immediate close-out, because the expense of buying back the short call can be quite large percentagewise. A riskier downside defensive action is to sell out the long call if the stock begins to break down heavily. In this way, the spreader recovers something from the long side of his spread immediately, and then looks for the stock to remain depressed so that the short side of the spread will expire worthless. This action requires that one have enough collateral available to margin the resulting naked call, often an amount substantially in excess of the original debit paid for the spread. Moreover, if the underlying stock should reverse direction and rally back to or above the striking price, the short side of the spread is naked and could produce substantial losses. The risk assumed by such a follow-up violates the initial neutral premise of the spread, and should therefore be avoided. Of these three types of downside defensive action, *the easiest and most conservative one is to do nothing at all*, letting the short call expire worthless and then hoping for a recovery by the underlying stock. If this tack is taken, the risk remains fixed at the original debit paid for the spread, and occasionally a rally may produce large profits on the long call. Although this rally is a nonfrequent event, it generally costs the spreader very little to allow himself the opportunity to take advantage of such a rally if it should occur.

In fact, the strategist can employ a slight modification of this sort of action, even if the spread is not at a large loss. If the underlying stock is moderately below the striking price at near-term expiration, the short option will expire worthless and the spreader will be left holding the long option. He could sell the long side immediately and perhaps take a small gain or loss. However, it is often a reasonable strategy to sell out a portion of the long side—recovering all or a substantial portion of the initial investment—and hold the remainder. If the stock rises, the remaining long position may appreciate substantially. Although this sort of action deviates from the true nature of the time spread, it is not overly risky.

An early breakout to the upside by the underlying stock is generally handled in much the same way as a downside breakout. Doing nothing is often the best course of action. If the underlying stock rallies shortly after the spread is established, the spread will shrink by a small amount, but not substantially, because both options will hold premium in a rally. If the spreader were to rush in to close the position, he would be paying commissions on two rather expensive options. He will usually do better to wait and give himself as much of a chance for a reversal as possible. In fact, even at near-term expiration, there will normally be some time premium left in the long option so that the maximum loss would not have to be realized. A highly risk-oriented upside defensive action is to cover the short call on a technical breakout and continue to hold the long call. This can become disastrous if the breakout fails and the stock drops, possibly resulting in losses far in excess

of the original debit. Therefore, this action cannot be considered anything but extremely aggressive and illogical for the neutral strategist.

If a breakout does not occur, the spreader will normally be making unrealized profits as time passes. Should this be the case, he may want to set some mental stop-out points for himself. For example, if the underlying stock is quite close to the striking price with only two weeks to go, there will be some more profit potential left in the spread, but the spreader should be ready to close the position quickly if the stock begins to get too far away from the striking price. In this manner, he can leave room for more profits to accrue, but he is also attempting to protect the profits that have already built up. This is somewhat similar to the action that the ratio writer takes when he narrows the range of his action points as more and more time passes.

THE BULLISH CALENDAR SPREAD

A less neutral and more bullish type of calendar spread is preferred by the more aggressive investor. In a bullish calendar spread, one sells the near-term call and buys a longer-term call, but *he does this when the underlying stock is some distance below the striking price of the calls.* This type of position has the attractive features of low dollar investment and large potential profits. Of course, there is risk involved as well.

Example: One might set up a bullish calender spread in the following manner:

XYZ common, 45;
sell the XYZ April 50 for 1; and
buy the XYZ July 50 for 1.50.

This investor ideally wants two things to happen. *First, he would like the near-term call to expire worthless.* That is why the bullish calendar spread is established with out-of-the-money calls: to increase the chances of the short call expiring worthless. If this happens, the investor will then own the longer-term call at a net cost of his original debit. In this example, his original debit was only 50 cents to create the spread. If the April 50 call expires worthless, the investor will own the July 50 call at a net cost of 0.50, plus commissions.

The investor now needs a second criterion to be fulfilled: The stock must rise in price by the time the July 50 call expires. In this example, even if XYZ were to rally to only 52 between April and July, the July 50 call could be sold for at least 2 points. This represents a substantial percentage gain, because the cost of the call has been reduced to 50 cents. Thus, there is the potential for large profits in bullish calendar spreads if the

underlying stock rallies above the striking price before the longer-term call expires, provided that the short-term call has already expired worthless.

What chance does the investor have that both ideal conditions will occur? There is a reasonably good chance that the written call will expire worthless, since it is a short-term call and the stock is below the striking price to start with. If the stock falls, or even rises a little—up to, but not above, the striking price—the first condition will have been met. It is the second condition, a rally above the striking price by the underlying stock before the longer-term expiration date, that normally presents the biggest problem. The chances of this happening are usually small, but the rewards can be large when it does happen. Thus, *this strategy offers a small probability of making a large profit.* In fact, one large profit can easily offset several losses, because the losses are small, dollarwise. Even if the stock remains depressed and the July 50 call in the example expires worthless, the loss is limited to the initial debit of 50. Of course, this loss represents 100% of the initial investment, so one cannot put all his money into bullish calendar spreads.

This strategy is a reasonable way to speculate, provided that the spreader adheres to the following criteria when establishing the spread:

1. *Select underlying stocks that are volatile enough to move above the striking price within the alloted time.* Bullish calendar spreads may appear to be very "cheap" on nonvolatile stocks that are well below the striking price. But if a large stock move, say 20%, is required in only a few months, the spread is not worthwhile for a nonvolatile stock.
2. *Do not use options more than one striking price above the current market.* For example, if XYZ were 26, use the 30 strike, not the 35 strike, since the chances of a rally to 30 are many times greater than the chances of a rally to 35.
3. *Do not invest a large percentage of available trading capital in bullish calendar spreads.* Since these are such low-cost spreads, one should be able to follow this rule easily and still diversify into several positions.

FOLLOW-UP ACTION

If the underlying stock should rally before the near-term call expires, the bullish calendar spreader must never consider "legging" out of the spread, or consider covering the short call at a loss and attempting to ride the long call. Either action could turn the initial small, limited loss into a disastrous loss. Since the strategy hinges on the fact that all the losses will be small and the infrequent large profits will be able to overcome these small losses, one should do nothing to jeopardize the strategy and possibly generate a large loss.

The only reasonable sort of follow-up action that the bullish calendar spreader can take in advance of expiration is to close the spread if the underlying stock has moved up in price and the spread has widened to become profitable. This might occur if the stock moves up to the striking price after some time has passed, and/or the implied volatility of the options has increased. In the example above, if XYZ moved up to 50 with a month or so of life left in the April 50 call, the call might be selling for 1.50 while the July 50 call might be selling for 3 points. Thus, the spread could be closed at 1.50, representing a 1-point gain over the initial debit of 50 cents. Two commissions would have to be paid to close the spread, of course, but there would still be a net profit in the spread.

USING ALL THREE EXPIRATION SERIES

In either the neutral calendar spread or the bullish calendar spread, the investor has three choices of which months to use. He could sell the nearest-term call and buy the intermediate-term call. This is usually the most common way to set up these spreads. However, there is no rule that prevents him from selling the intermediate-term and buying the longest-term, or possibly selling the near-term and buying the long-term. Any of these situations would still be calendar spreads.

Some proponents of calendar spreads prefer initially to sell the near-term and buy the long-term call. Then, if the near-term call expires worthless, they have an opportunity to sell the intermediate-term call if they so desire.

Example: An investor establishes a calendar spread by selling the April 50 call and buying the October 50 call. The April call would have less than 3 months remaining and the October call would be the long-term call. At April expiration, if XYZ is below 50, the April call will expire worthless. At that time, the July 50 call could be sold against the October 50 that is held long, thereby creating another calendar spread with no additional commission cost on the long side.

The advantage of this type of strategy is that it is possible for the two sales (April 50 and July 50 in this example) to actually bring in more credits than were spent for the one purchase (October 50). Thus, the spreader might be able to create a position in which he has a guaranteed profit. That is, if the sum of his transactions is actually a credit, he cannot lose money in the spread (provided that he does not attempt to "leg" out of the spread). The disadvantage of using the long-term call in the calendar spread is that the initial debit is larger, and therefore more dollars are initially at risk. If the underlying stock moves substantially up or down in the first 3 months, the spreader could realize a larger dollar loss with the October/April spread because his loss will approach the initial debit.

The remaining combination of the expiration series is to initially buy the longest-term call and sell the intermediate-term call against it. This combination will generally require the smallest initial debit, but there is not much profit potential in the spread until the intermediate-term expiration date draws near. Thus, there is a lot of time for the underlying stock to move some distance away from the initial striking price. For this reason, this is generally an inferior approach to calendar spreading.

SUMMARY

Calendar spreading is a low-dollar-cost strategy that is a nonaggressive approach, provided that the spreader does not invest a large percentage of his trading capital in the strategy, and provided that he does not attempt to "leg" into or out of the spreads. The neutral calendar spread is one in which the strategist is mainly selling time; he is attempting to capitalize on the known fact that the near-term call will lose time premium more rapidly than will a longer-term call. A more aggressive approach is the bullish calendar spread, in which the speculator is essentially trying to reduce the net cost of a longer-term call by the amount of credits taken in from the sale of a nearer-term call. This bullish strategy requires that the near-term call expire worthless and then that the underlying stock rise in price. In either strategy, the most common approach is to sell the nearest-term call and buy the intermediate-term call. However, it may sometimes prove advantageous to sell the near-term and buy the longest-term initially, with the intention of letting the near-term expire and then possibly writing against the longer-term call a second time. In all cases, an increase in the implied volatility of the options while the spread is in place would be a benefit to the calendar spreader, and conversely a decrease in implied volatility would be to his detriment.

CHAPTER 10

The Butterfly Spread

The recipient of one of the more exotic names given to spread positions, *the butterfly spread is a neutral position that is a combination of both a bull spread and a bear spread.* This spread is for the neutral strategist, one who thinks the underlying stock will not experience much of a net rise or decline by expiration. It generally requires only a small investment and has limited risk. Although profits are limited as well, they are large than the potential risk. For this reason, the butterfly spread is a viable strategy. However, it is costly in terms of commissions. In this chapter, the strategy is explained using only calls. The strategy can also be implemented using a combination of puts and calls, or with puts only, as will be demonstrated later.

There are three striking prices involved in a butterfly spread. Using only calls, the butterfly spread consists of buying one call at the highest striking price. The following example will demonstrate how the butterfly spread works.

Example: A butterfly spread is established by buying a July 50 call for 12, selling 2 July 60 calls for 6 each, and buying a July 70 call for 3. The spread requires a relatively low debit of $300 (Table 10-1), although there are four option commissions involved and these may represent a substantial percentage of the net investment. As usual, *the maximum amount of profit is realized at the striking price of the written calls.* With most types of spreads, this is a useful fact to remember, for it can aid in quick computation of the potential of the spread. In this example, if the stock were at the striking price of the written options at expiration (60), the two July 60's that are short would expire worthless for a $1,200 gain. The long July 70 call would expire worthless for a $300 loss, and the long July 50 call would be worth 10 points, for a $200 loss on that call. The sum of the gains and losses would thus be a $700 gain, less commissions. This is the maximum profit potential of the spread.

TABLE 10-1.
Butterfly spread example.

Current prices:	
XYZ common:	60
XYZ July 50 call:	12
XYZ July 60 call:	6
XYZ July 70 call:	3
Butterfly spread:	
Buy 1 July 50 call	$1,200 debit
Sell 2 July 60 calls	$1,200 credit
Buy 1 July 70 call	$300 debit
Net debit	$300 (plus commissions)

The risk is limited in a butterfly spread, both to the upside and to the downside, and is equal to the amount of the net debit required to establish the spread. In the example above, the risk is limited to $300 plus commissions.

Table 10-2 and Figure 10-1 depict the results of this butterfly spread at various prices at expiration. The profit graph resembles that of a ratio write, except that the loss is limited on both the upside and the downside. There is a profit range within which the butterfly spread makes money—53 to 67 in the example, before commissions are included. Outside this profit range, losses will occur at expiration, but these losses are limited to the amount of the original debit plus commissions.

In accordance with more lenient margin requirements passed in 2000, the investment required for a butterfly spread is equal to the net debit expended, which is the risk in the spread. When the options expire in the same month and the striking prices are evenly spaced (the spacing is 10 points in this example), the following formulae can be used to quickly compute the important details of the butterfly spread:

Net investment = Net debit of the spread
Maximum profit = Distance between strikes – Net debit
Downside break-even = Lowest strike + Net debit
Upside break-even = Highest strike – Net debit

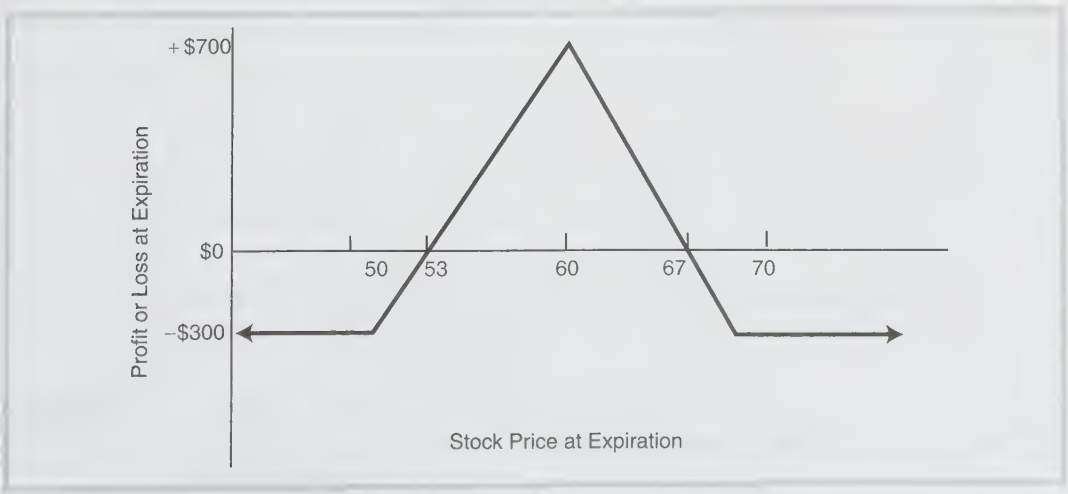
In the example, the distance between strikes is 10 points, the net debit is 3 points (before commissions), the lowest strike used is 50, and the highest strike is 70. These formulae would then yield the following results for this example spread.

Net investment = 3 points = $300
Maximum profit = 10 – 3 = $700
Downside break-even = 50 + 3 = 53
Upside break-even = 70 – 3 = 67

TABLE 10-2.
Results of butterfly spread at expiration.

XYZ Price at Expiration	July 50 Profit	July 60 Profit	July 70 Profit	Total Profit
40	–$1,200	+$1,200	–$300	–$300
50	– 1,200	+ 1,200	– 300	– 300
53	– 900	+ 1,200	– 300	0
56	– 600	+ 1,200	– 300	+ 300
60	– 200	+ 1,200	– 300	+ 700
64	+ 200	+ 400	– 300	+ 300
67	+ 500	– 200	– 300	0
70	+ 800	– 800	– 300	– 300
80	+ 1,800	– 2,800	+ 700	– 300

FIGURE 10-1.
Butterfly spread.



Note that all of these answers agree with the results that were previously obtained by analyzing the example spread in detail.

In this example, the maximum profit potential is $700, the maximum risk is $300, and the investment required is also $300, commissions excluded. In percentage terms, this means that the butterfly spread has a loss limited to about 100% of capital invested and could make profits of nearly 133% in this case. These represent an attractive risk/reward relationship. This is, however, just an example, and two factors that exist in the actual marketplace may greatly affect these numbers. First, commissions are large; it is possible that eight commissions might have to be paid to establish and liquidate the spread. Second, depending on the level of premiums to be found in the market at any point in time, it may not be possible to establish a spread for a debit as low as 3 points when the strikes are 10 points apart.

SELECTING THE SPREAD

Ideally, one would want to establish a butterfly spread at as small of a debit as possible in order to limit his risk to a small amount, although that risk is still equal to 100% of the dollars invested in the spread. One would also like to have the stock be near the middle striking price to begin with, because he will then be in his maximum profit area if the stock remains relatively unchanged. Unfortunately, it is difficult to satisfy both conditions simultaneously.

The smallest-debit butterfly spreads are those in which the stock is some distance away from the middle striking price. To see this, note that if the stock were well above the middle strike and all the options were at parity, the net debit would be zero. Although no one would attempt to establish a butterfly spread with parity options because of the risk of early assignment, it may be somewhat useful to try to obtain a small debit by taking an opinion on the underlying stock. For example, if the stock is close to the higher striking price, the debit would be small normally, but the investor would have to be somewhat bearish on the underlying stock in order to maximize his profit; that is, the stock would have to decline in price from the upper striking price to the middle striking price for the maximum profit to be realized. An analogous situation exists when the underlying stock is originally close to the lower striking price. The investor could establish the spread for a small debit in this case also, but he would now have to be somewhat bullish on the underlying stock in order to attempt to realize his maximum profit.

Example: XYZ is at 70. One may be able to establish a low-debit butterfly spread with the 50's, 60's, and 70's if the following prices exist:

XYZ common, 70;
XYZ July 50, 20;
XYZ July 60, 12; and
XYZ July 70, 5.

The butterfly spread would require a debit of only $100 plus commissions to establish, because the cost of the calls at the higher and lower strike is 25 points, and a 24-point credit would be obtained by selling two calls at the middle strike. This is indeed a low-cost butterfly spread, but the stock will have to move down in price for much of a profit to be realized. The maximum profit of $900 less commissions would be realized at 60 at expiration. The strategist would have to be bearish on XYZ to want to establish such a spread.

Without the aid of an example, the reader should be able to determine that if XYZ were originally at 50, a low-cost butterfly spread could be established by buying the 50, selling two 60's, and buying a 70. In this case, however, the investor would have to be bullish on the stock, because he would want it to move up to 60 by expiration in order for the maximum profit to be realized.

In general, then, if the butterfly spread is to be established at an extremely low debit, the spreader will have to make a decision as to whether he wants to be bullish or bearish on the underlying stock. Many strategists prefer to remain as neutral as possible on the underlying stock at all times in any strategy. This philosophy would lead to slightly higher debits, such as the $300 debit in the example at the beginning of this chapter, but would theoretically have a better chance of making money because there would be a profit if the stock remained relatively unchanged, the most probable occurrence.

In either philosophy, there are other considerations for the butterfly spread. *The best butterfly spreads are generally found on the more expensive and/or more volatile stocks that have striking prices spaced 10 or 20 points apart.* In these situations, the maximum profit is large enough to overcome the weight of the commission costs involved in the butterfly spread. When one establishes butterfly spreads on lower-priced stocks whose striking prices are only 5 points apart, he is normally putting himself at a disadvantage unless the debit is extremely small. One exception to this rule is that attractive situations are often found on higher-priced stocks with striking prices 5 points apart (50, 55, and 60, for example). They do exist from time to time.

In analyzing butterfly spreads, one commonly works with closing prices. It was mentioned earlier that using closing prices for analysis can prove somewhat misleading, since the actual execution will have to be done at bid and asked prices, and these may differ somewhat from closing prices. Normally, this difference is small, but since there are three different calls involved in a butterfly spread, the difference could be substantial. Therefore,

it is usually necessary to check the appropriate bid and asked price for each call before entering the spread, in order to be able to place a reasonable debit on the order. As with other types of spreads, the butterfly spread order can be placed as one order.

Before moving on to discuss follow-up action, it may be worthwhile to describe a tactic for stocks with 5 points between striking prices. For example, the butterfly spreader might work with strikes of 45, 50, and 60. If he sets up the usual type of butterfly spread, he would end up with a position that has too much risk near 60 and very little or none at all near 45. If this is what he wants, fine; but if he wants to remain neutral, the standard type of butterfly spread will have to be modified slightly.

Example: The following prices exist:

XYZ common, 50;
July 45 call, 7;
July 50 call, 5; and
July 60 call, 2.

The normal type of butterfly spread—buying one 45, selling two 50's, and buying one 60—can actually be done for a credit of 1 point. However, the profitability is no longer symmetric about the middle striking price. In this example, the investor cannot lose to the downside because, even if the stock collapses and all the calls expire worthless, he will still make his 1-point credit. However, to the upside, there is risk: If XYZ is anywhere above 60 at expiration, the risk is 4 points. This is no longer a neutral position. The fact that the lower strike is only 5 points from the middle strike while the higher strike is 10 points away has made this a somewhat bearish position. If the spreader wants to be neutral and still use these striking prices, he will have to put on two bull spreads and only one bear spread. That is, he should:

Buy 2 July 45's:	$1,400 debit
Sell 3 July 50's:	$1,500 credit
Buy 1 July 60:	$200 debit

This position now has a net debit of $100 but has a better balance of risk at either end. If XYZ drops and is below 45 at expiration, the spreader will lose his $100 initial debit. But now, if XYZ is at or above 60 at expiration, he will lose $100 in that range also. Thus, by establishing two bull spreads with a 5-point difference between strikes versus one bear spread with a 10-point difference between strikes, the risk has been balanced at both ends. When one uses strike prices that are *not* evenly spaced apart, his margin requirement increases substantially. In such a case, one has to margin the individual component spreads separately. Therefore, in this example, he would have to pay for the two bull

spreads ($200 each, for a total of $400) and then margin the additional call bear spread ($700: the $1,000 difference in the strikes, less the $300 credit taken in for that portion of the spread). Hence, in this example, the margin requirement would be $1,100, even though the risk is only $100. Technically, of that $1,100 requirement, the spread trader pays out only $100 in cash (the actual debit of the spread), and the rest of the requirement can be satisfied with excess equity in his account.

The same analysis obviously applies whenever 5-point striking price intervals exist. There are numerous combinations that could be worked out for lower-priced stocks by merely skipping over a striking price (using the 25's, 30's, and 40's, for example). Although there are not normally many stocks trading over $100 per share, the same analysis is applicable using 130's, 140's, and 160's, for example.

FOLLOW-UP ACTION

Since the butterfly spread has limited risk by its construction, there is usually little that the spreader has to do in the way of follow-up action other than avoiding early exercise or possibly closing out the position early to take profits or limit losses even further. The only part of the spread that is subject to assignment is the call at the middle strike. If this call trades at or near parity, in-the-money, the spread should be closed. This may happen before expiration if the underlying stock is about to go ex-dividend. It should be noted that accepting assignment will not increase the risk of the spread (because any short calls assigned would still be protected by the remaining long calls). However, the margin requirement would change substantially, since one would now have a synthetic put (long calls, short stock) in place. Plus, there may be more onerous commissions for trading stock. Therefore, it is usually wise to avoid assignment in a butterfly spread, or in any spread, for that matter.

If the stock is near the middle strike after a reasonable amount of time has passed, an unrealized profit will begin to accrue to the spreader. If one feels that the underlying stock is about to move away from the middle striking price and thereby jeopardize these profits, it may be advantageous to close the spread to take the available profit. Be certain to include commission costs when determining if an unrealized profit exists.

Normally, one would not close the spread early to limit losses, since these losses are limited to the original net debit in any case. However, if the original debit was large and the stock is beginning to break out above the higher strike or to break down below the lower strike, the spreader may want to close the spread to limit losses even further.

It has been repeatedly stated that one should not attempt to "leg" out of a spread because of the risk that is incurred if one is wrong. However, there is a method of legging out of a butterfly spread that is acceptable and may even be prudent. Since the spread consists of both a bull spread and a bear spread, it may often be the case that the stock

experiences a relatively substantial move in one direction or the other during the life of the butterfly spread, and that the bull spread portion or the bear spread portion could be closed out near their maximum profit potentials. If this situation arises, the spreader may want to take advantage of it in order to be able to profit more if the underlying stock reverses direction and comes back into the profit range.

Example: This strategy can be explained by using the initial example from this chapter and then assuming that the stock falls from 60 to 45. Recall that this spread was initially established with a 3-point debit and a maximum profit potential of 7 points. The profit range was 53 to 67 at July expiration. However, a rather unpleasant situation has occurred: The stock has fallen quickly and is below the profit range. If the spreader does nothing and keeps the spread on, he will lose 3 points at most if the stock remains below 50 until July expiration. However, by increasing his risk slightly, he may be able to improve his position. Notice in Table 10-3 that the bear spread portion of the overall spread—short July 60, long July 70—has very nearly reached its maximum potential. The bear spread could be bought back for 50 cents total (pay 1 point to buy back the July 60 and receive .50 from selling out the July 70). Thus, the spreader could convert the butterfly spread to a bull spread by spending 50 cents. What would such an action do to his overall position? First, his risk would be increased by the 50 cents spent to close the bear spread. That is, if XYZ continues to remain below 50 until July expiration, he would now lose 3.50 rather than 3 points, plus commissions in either case. He has, however, potentially helped his chances of realizing something close to the maximum profit available from the original butterfly spread.

TABLE 10-3.
Initial spread and current prices.

Initial Spread		Current Prices	
XYZ common:	60	XYZ common:	45
July 50 call:	12	July 50 call:	2
July 60 call:	6	July 60 call:	1
July 70 call:	3	July 70 call:	.50

After buying back the bear spread, he is left with the following bull spread:

Long July 50 call
Short July 60 call – Net debit 3.50 points

He has a bull spread at the total cost paid to date—3.50 points. From the earlier discussion of bull spreads, the reader should know that the break-even point for this position is 53.50 at expiration, and it could make a 6.50 point profit if XYZ is anywhere over 60 at

July expiration. Hence, the break-even point for the position was raised from 53 to 53.50 by the expense of the 50 cents to buy back the bear spread. However, if the stock should rally back above 60, the strategist will be making a profit nearly equal to the original maximum profit that he was aiming for (7 points). Moreover, this profit is now available anywhere over 60, not just exactly at 60 as it was in the original position. Although the chances of such a rally cannot be considered great, it does not cost the spreader much to restructure himself into a position with a much broader maximum profit area.

A similar situation is available if the underlying stock moves up in price. In that case, the bull spread may be able to be removed at nearly its maximum profit potential, thereby leaving a bear spread. Again, suppose that the same initial spread was established but that XYZ has risen to 75. When the underlying stock advances substantially, the bull spread portion of the butterfly spread may expand to near its maximum potential. Since the strikes are 10 points apart in this bull spread, the widest it can grow to is 10 points. At the prices shown in Table 10-4, the bull spread—long July 50 and short July 60—has grown to 9.50 points. Thus, the bull spread position could be removed within 50 cents of its maximum profit potential and the original butterfly spread would become a bear spread. Note that the closing of the bull spread portion generates a 9.50 point credit: The July 50 is sold at 25.50 and the July 60 is bought back at 16. The original butterfly spread was established at a 3-point debit, so the net position is the remaining position:

Long July 70 call
Short July 60 call – Net credit 6.50 points

This bear spread has a maximum profit potential of 6.50 points anywhere below 60 at July expiration. The maximum risk is 3.50 points anywhere above 70 at expiration. Thus, the original butterfly spread was again converted into a position such that a stock price reversal to any price below 60 could produce something close to the maximum profit. Moreover, the risk was only increased by an additional 50 cents.

TABLE 10-4.
Initial spread and new current prices.

Initial Spread		Current Prices	
XYZ common:	60	XYZ common:	75
XYZ July 50 call:	12	July 50 call:	25.50
July 60 call:	6	July 60 call:	16
July 70 call:	3	July 70 call:	7

SUMMARY

The butterfly spread is a viable, low-cost strategy with both limited profit potential and limited risk. It is actually a combination of a bull spread and a bear spread, and involves using three striking prices. The risk is limited should the underlying stock fall below the lowest strike or rise above the highest strike. The maximum profit is obtained at the middle strike. One can keep his initial debits to a minimum by initially assuming a bullish or bearish posture on the underlying stock. If he would rather remain neutral, he will normally have to pay a slightly larger debit to establish the spread, but may have a better chance of making money. If the underlying stock experiences a large move in one direction or the other prior to expiration, the spreader may want to close the profitable side of his butterfly spread near its maximum profit potential in order to be able to capitalize on a stock price reversal, should one occur.

CHAPTER 11

Ratio Call Spreads

A ratio call spread is a neutral strategy in which one buys a number of calls at a lower strike and sells more calls at a higher strike. It is somewhat similar to a ratio write in concept, although the spread has less downside risk and normally requires a smaller investment than does a ratio write. The ratio spread and ratio write are similar in that both involve uncovered calls, and both have profit ranges within which a profit can be made at expiration. Other comparisons are demonstrated throughout the chapter.

Example: The following prices exist:

XYZ common, 44;
XYZ April 40 call, 5; and
XYZ April 45 call, 3.

A 2:1 ratio call spread could be established by buying one April 40 call and simultaneously selling two April 45's. This spread would be done for a credit of 1 point—the sale of the two April 45's bringing in 6 points and the purchase of the April 40 costing 5 points. This spread can be entered as one spread order, specifying the net credit or debit for the position. In this case, the spread would be entered at a net credit of 1 point.

Ratio spreads, unlike ratio writes, have a relatively small, limited downside risk. In fact, if the spread is established at an initial credit, there is no downside risk at all. In a ratio spread, *the profit or loss at expiration is constant below the lower striking price,* because both options would be worthless in that area. In the example above, if XYZ is below 40 at April expiration, all the options would expire worthless and the spreader would have made a profit of his initial 1-point credit, less commissions. This 1-point gain would occur anywhere below 40 at expiration; it is a constant.

The maximum profit at expiration for a ratio spread occurs if the stock is exactly at the striking price of the written options. This is true for nearly all types of strategies involving written options. In the example, if XYZ were at 45 at April expiration, the April 45 calls would expire worthless for a gain of $600 on the two of them, and the April 40 call would be worth 5 points, resulting in no gain or loss on that call. Thus, the total profit would be $600 less commissions.

The greatest risk in a ratio call spread lies to the upside, where the loss may theoretically be unlimited. The upside break-even point in this example is 51, as shown in Table 11-1. The table and Figure 11-1 illustrate the statements made in the preceding paragraphs.

In a 2:1 ratio spread, two calls are sold for each one purchased. The maximum profit amount and the upside break-even point can easily be computed by using the following formulae:

Points of maximum profit = Initial credit + Difference between strikes *or*
= Difference between strikes – Initial debit

Upside break-even point = Higher strike price + Points of maximum profit

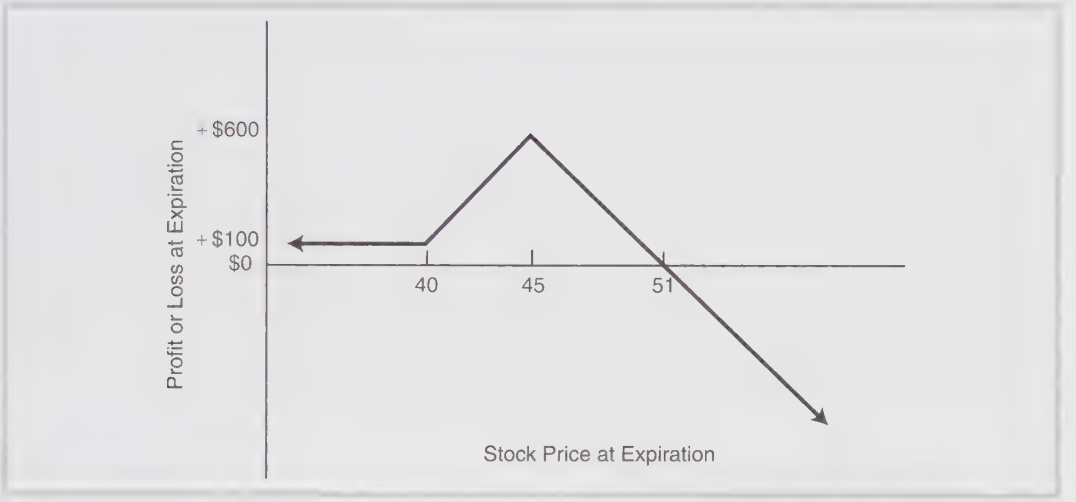
In the preceding example, the initial credit was 1 point, so the points of maximum profit = 1 + 5 = 6, or $600. The upside break-even point is then 45 + 6, or 51. This agrees with the results determined earlier. Note that if the spread is established at a debit rather than a credit, the debit is subtracted from the striking price differential to determine the points of maximum profit.

Many neutral investors prefer ratio spreads over ratio writes for two reasons:

TABLE 11-1.
Ratio call spread.

XYZ Price at Expiration	April 40 Call Profits	April 45 Call Profits	Total Profits
35	– $ 500	+ $ 600	+$100
40	– 500	+ 600	+ 100
42	– 300	+ 600	+ 300
45	0	+ 600	+ 600
48	+ 300	0	+ 300
51	+ 600	– 600	0
55	+ 1,000	– 1,400	– 400
60	+ 1,500	– 2,400	– 900

FIGURE 11-1.
Ratio call spread (2:1).



1. The downside risk or gain is predetermined in the ratio spread at expiration, and therefore the position does not require much monitoring on the downside.
2. The margin investment required for a ratio spread is normally smaller than that required for a ratio write, since on the long side one is buying a call rather than buying the common stock itself.

For margin purposes, a ratio spread is really the combination of a bull spread and a naked call write. There is no margin requirement for a bull spread other than the net debit to establish the bull spread. The net investment for the ratio spread is thus equal to the collateral required for the naked calls in the spread plus or minus the net debit or credit of the spread. In the example above, there is one naked call. The requirement for the naked call is 20% of the stock price plus the call premium, less the out-of-the-money amount. So the requirement in the example would be 20% of 44, or $880, plus the call premium of $300, less the one point that the stock is below the striking price—a $1,080 requirement for the naked call. Since the spread was established at a credit of one point, this credit can also be applied against the initial requirement, thereby reducing that requirement to $980. Since there is a naked call in this spread, there will be a mark to market if the stock moves up. Just as was recommended for the ratio write, *it is recommended that the ratio spreader allow at least enough collateral to reach the upside break-even point.* Since the upside breakeven point is 51 in this example, the spreader should allow 20% of 51, or $1,020, plus the 6 points that the call would be worth less the 1-point initial net credit—a total of $1,520 for this spread ($1,020 + $600 – $100).

DIFFERING PHILOSOPHIES

For many strategies, there is more than one philosophy of how to implement the strategy. Ratio spreads are no exception, with three philosophies being predominant. One philosophy holds that ratio spreading is quite similar to ratio writing—that one should be looking for opportunities to purchase an in-the-money call with little or no time premium in it so that the ratio spread simulates the profit opportunities from the ratio write as closely as possible with a smaller investment. The ratio spreads established under this philosophy may have rather large debits if the purchased call is substantially in-the-money. Another philosophy of ratio spreading is that spreads should be established for credits so that there is no chance of losing money on the downside. Both philosophies have merit and both are described. A third philosophy, called the "delta spread," is more concerned with neutrality, regardless of the initial debit or credit. It is also described.

RATIO SPREAD AS RATIO WRITE

There are several spread strategies similar to strategies that involve common stock. In this case, the ratio spread is similar to the ratio write. Whenever such a similarity exists, it may be possible for the strategist to buy an in-the-money call with little or no time premium as a substitute for buying the common stock. This was seen earlier in the covered call writing strategy, where it was shown that the purchase of in-the-money calls or warrants might be a viable substitute for the purchase of stock. *If one is able to buy an in-the-money call as a substitute for the stock, he will not affect his profit potential substantially.* When comparing a ratio spread to a ratio write, the maximum profit potential and the profit range are reduced by the time value premium paid for the long call. If this call is at parity (the time value premium is thus zero), the ratio spread and the ratio write have exactly the same profit potential. Moreover, the net investment is reduced and there is less downside risk should the stock fall in price below the striking price of the purchased call. The spread also involves smaller commission costs than does the ratio write, which involves a stock purchase. The ratio writer does receive stock dividends, if any are paid, whereas the spreader does not.

Example: XYZ is at 50, and an XYZ July 40 call is selling for 11 while an XYZ July 50 call is selling for 5. Table 11-2 compares the important points between the ratio write and the ratio spread.

In Chapter 6, it was pointed out that ratio writing was one of the better strategies from a probability of profit viewpoint. That is, the profit potential conforms well to the expected movement of the underlying stock. The same statement holds true for ratio

TABLE 11-2.
Ratio write and ratio spread compared.

	Ratio Write: Buy XYZ at 50 and Sell 2 July 50's at 5	Ratio Spread: Buy 1 July 40 at 11 and Sell 2 July 50's at 5
Profit range	40 to 60	41 to 59
Maximum profit	10 points	9 points
Downside risk	40 points	1 point
Upside risk	Unlimited	Unlimited
Initial investment	$3,000	$1,600

spreads as substitutes for ratio writes. In fact, the ratio spread may often be a better position than the ratio write itself, when the long call can be purchased with little or no time value premium in it.

RATIO SPREAD FOR CREDITS

The second philosophy of ratio spreads is to establish them only for credits. Strategists who follow this philosophy generally want a second criterion fulfilled also: that the underlying stock be below the striking price of the written calls when the spread is established. In fact, the farther the stock is below the strike, the more attractive the spread would be. This type of ratio spread has no downside risk because, even if the stock collapses, the spreader will still make a profit equal to the initial credit received. This application of the ratio spread strategy is actually a subcase of the application discussed above. That is, it may be possible both to buy a long call for little or no time premium, thereby simulating a ratio write, and also to be able to set up the position for a credit.

Since the underlying stock is generally below the maximum profit point when one establishes a ratio spread for a credit, *this is actually a mildly bullish position.* The investor would want the stock to move up slightly in order for his maximum profit potential to be realized. Of course, the position does have unlimited upside risk, so it is not an overly bullish strategy.

These two philosophies are not mutually exclusive. The strategist who uses ratio spreads without regard for whether they are debit or credit spreads will generally have a broader array of spreads to choose from and will also be able to assume a more neutral posture on the stock. The spreader who insists on generating credits only will be forced to establish spreads on which his return will be slightly smaller if the underlying stock remains relatively unchanged. However, he will not have to worry about downside

defensive action, since he has no risk to the downside. The third philosophy, the "delta spread," is described after the next section, in which the uses of ratios other than 2:1 are described.

ALTERING THE RATIO

Under either of the two philosophies discussed above, the strategist may find that a 3:1 ratio or a 3:2 ratio better suits his purposes than the 2:1 ratio. It is not common to write in a ratio of greater than 4:1 because of the large increase in upside risk at such high ratios. The higher the ratio that is used, the higher will be the credits of the spread. This means that the profits to the downside will be greater if the stock collapses. The lower the ratio that is used, the higher the upside break-even point will be, thereby reducing upside risk.

Example: If the same prices are used as in the initial example in this chapter, it will be possible to demonstrate these facts using three different ratios (Table 11-3):

XYZ common, 44;
XYZ April 40 call, 5; and
XYZ April 45 call, 3.

In Chapter 6 on ratio writing, it was seen that it was possible to alter the ratio to adjust the position to one's outlook for the underlying stock. The altering of the ratio in a ratio spread accomplishes the same objective. In fact, as will be pointed out later in the chapter, the ratio may be adjusted continuously to achieve what is considered to be a "neutral spread." A similar tactic, using the option's delta, was described for ratio writes.

TABLE 11-3.
Comparison of three ratios.

	3:2 Ratio: Buy 2 April 40's Sell 3 April 45's	2:1 Ratio: By 1 April 40 Sell 2 April 45's	3:1 Ratio: Buy 1 April 40 Sell 3 April 45's
Price of spread (downside risk)	1 debit	1 credit	4 credit
Upside break-even	54	51	49.50
Downside break-even	40.50	None	None
Maximum profit	9	6	9

The following formulae allow one to determine the maximum profit potential and upside break-even point for any ratio:

$$\text{Points of maximum profit} = \text{Net credit} + \text{Number of long calls} \times \text{Difference in striking prices } \textit{or}$$

$$= \text{Number of long calls} \times \text{Difference in striking prices} - \text{Net debit}$$

$$\text{Upside break-even point} = \frac{\text{Points of maximum profit}}{\text{Number of naked calls}} + \text{Higher striking price}$$

These formulae can easily be verified by checking the numbers in Table 11-3.

THE "DELTA SPREAD"

The third philosophy of ratio spreading is a more sophisticated approach that is often referred to as the *delta spread*, because the deltas of the options are used to establish and monitor the spread. Recall that the delta of a call option is the amount by which the option is expected to increase in price if the underlying stock should rise by one point. *Delta spreads are neutral spreads* in that one uses the deltas of the two calls to set up a position that is initially neutral.

Example: The deltas of the two calls that appeared in the previous examples were .80 and .50 for the April 40 and April 45, respectively. If one were to buy 5 of the April 40's and simultaneously sell 8 of the April 45's, he would have a delta-neutral spread. That is, if XYZ moved up by one point, the 5 April 40 calls would appreciate by .80 point each, for a net gain of 4 points. Similarly, the 8 April 45 calls that he is short would each appreciate by .50 for a net loss of 4 points on the short side. Thus, the spread is initially neutral—the long side and the short side will offset each other. *The idea of setting up this type of neutral spread is to be able to capture the time value premium decay in the preponderance of short calls without subjecting the spread to an inordinate amount of market risk.* The actual credit or debit of the spread is not a determining factor.

It is a fairly simple matter to determine the correct ratio to use in the delta spread: Merely *divide the delta of the purchased call by the delta of the written call.* In the example, this implies that the neutral ratio is .80 divided by .50, or 1.6:1. Obviously, one cannot sell 1.6 calls, so it is common practice to express that ratio as 16:10. Thus, the neutral spread would consist of buying 10 April 40's and selling 16 April 45's. This is the same as an 8:5 ratio. Notice that this calculation does not include anything about debits or credits involved in the spread. In this example, an 8:5 ratio would involve a small debit

of one point (5 April 40's cost 25 points and 8 April 45's bring in 24 points). Generally, reasonably selected delta spreads involve small debits.

Certain selection criteria can be offered to help the spreader eliminate some of the myriad possibilities of delta spreads on a day-to-day basis. First, one does not want the ratio of the spread to be too large. An absolute limit, such as 4:1, can be placed on all spread candidates. Also, if one eliminates any options selling for less than .50 point as candidates for the short side of the spread, the higher ratios will be eliminated. Second, one does not want the ratio to be too small. If the delta-neutral ratio is less than 1.2:1 (6:5), the spread should probably be rejected. Finally, if one is concerned with downside risk, he might want to limit the total debit outlay. This might be done with a simple parameter, such as not paying a debit of more than 1 point per long option. Thus, in a spread involving 10 long calls, the total debit must be 10 points or less. These screens are easily applied, especially with the aid of a computer analysis. One merely uses the deltas to determine the neutral ratio. Then, if it is too small or too large, or if it requires the outlay of too large a debit, the spread is rejected from consideration. If not, it is a potential candidate for investment.

FOLLOW-UP ACTION

Depending on the initial credit or debit of the spread, it may not be necessary to take any downside defensive action at all. *If the initial debit was large, the writer may roll down the written calls as in a ratio write.*

Example: An investor has established the ratio write by buying an XYZ July 40 call and selling two July 60 calls with the stock near 60. He might have done this because the July 40 was selling at parity. If the underlying stock declines, this spreader could roll down to the 50's and then to the 45's, in the same manner as he would with a ratio write. *On the other hand, if the spread was initially set up with contiguous striking prices, the lower strike being just below the higher strike, no rolling-down action would be necessary.*

REDUCING THE RATIO

Upside follow-up action does not normally consist of rolling up as it does in a ratio write. Rather, *one should usually buy some more long calls to reduce the ratio in the spread.* Eventually, he would want to reduce the spread to 1:1, or a normal bull spread. An example may help to illustrate this concept.

Example: In the initial example, one April 40 call was bought and two April 45's were sold, for a net credit of one point. Assume that the spreader is going to buy one more April 40 as

a means of upside defensive action if he has to. When and if he buys this second long call, his total position will be a normal bull spread—long 2 April 40's and short 2 April 45's. The liquidating value of this bull spread would be 10 points if XYZ were above 45 at April expiration, since each of the two bull spreads would widen to its maximum potential (5 points) with the stock above 45 in April. The ratio spreader originally brought in a one-point credit for the 2:1 spread. If he were later to pay 11 points to buy the additional long April 40 call, his total outlay would have been 10 points. This would represent a break-even situation at April expiration if XYZ were above 45 at that time, since it was just shown that the spread could be liquidated for 10 points in that case. So the ratio spreader could wait to take defensive action until the April call was selling for 11 points. This is a dynamic type of follow-up action, one that is dependent on the options' price, not the stock price per se.

This outlay of 11 points for the April 40 would leave a break-even situation as long as the stock did not reverse and fall in price below 45 after the call was bought. The spreader may decide that he would rather leave some room for upside profit rather than merely trying to break even if the stock rallies too far. He might thus decide to buy the additional long call at 9 or 10 points rather than waiting for it to get to 11. Of course, this might increase the chances of a whipsaw occurring, but it would leave some room for upside profits if the stock continues to rise.

Where ratios other than 2:1 are involved initially, the same thinking can be applied. In fact, the purchase of the additional long calls might take place in a two-step process.

Example: If the spread was initially long 5 calls and short 10 calls, the spreader would not necessarily have to wait until the April 40's were selling at 11 and then buy all 5 needed to make the spread a normal bull spread. He might decide to buy 2 or 3 at a lower price, thereby reducing his ratio somewhat. Then, if the stock rallied even further, he could buy the needed long calls. By buying a few at a cheaper price, the spreader gives himself the leeway to wait considerably longer to the upside. In essence, all 5 additional long calls in this spread would have to be bought at an average price of 11 or lower in order for the spread to break even. However, if the first 2 of them are bought for 8 points, the spreader would not have to buy the remaining 3 until they were selling around 13. Thus, he could wait longer to the upside before reducing the spread ratio to 1:1 (a bull spread). A formula can be applied to determine the price one would have to pay for the additional long calls, to convert the ratio spread into a bull spread. If the calls are bought, such a bull spread would break even with the stock above the higher striking price at expiration:

$$\text{Break-even cost of long calls} = \frac{\text{Number of short calls} \times \text{Difference in strikes} - \text{Total debit to date}}{\text{Number of naked calls}}$$

In the simple 2:1 example, the number of short calls was 2, the difference in the strikes was 5, the total debit was minus one (–1) (since it was actually a 1-point credit), and the number of naked calls is 1. Thus, the break-even cost of the additional long call is $[2 \times 5 - (-1)(1)]/1 = 11$. As another verification of the formula, consider the 10:5 spread at the same prices. The initial credit of this spread would be 5 points, and the break-even cost of the five additional long calls is 11 points each. Assume that the spreader bought two additional April 40's for 8 points each (16 debit). This would make the total debit to date of the spread equal to 11 points, and reduce the number of naked calls to 3. The break-even cost of the remaining 3 long calls that would need to be purchased if the stock continued to rally would be $(10 \times 5 - 11)/3 = 13$. This agrees with the observation made earlier. This formula can be used before actual follow-up action is implemented. For example, in the 10:5 spread, if the April 40's were selling for 8, the spreader might ask: "To what would I raise the purchase price of the remaining long calls if I buy 2 April 40's for 8 right now?" By using the formula, he could easily see that the answer would be 13.

ADJUSTING WITH THE DELTA

The theoretically oriented spreader can use the delta-neutral ratio to monitor his spreads as well as to establish them. If the underlying stock moves up in price too far or down in price too far, the delta-neutral ratio of the spread will change. The spreader can then readjust his spread to a neutral status by buying some additional long calls on an upside movement by the stock, or by selling some additional short calls on a downward movement by the stock. Either action will serve to make the spread delta-neutral again. The public customer who is employing the delta-neutral adjustment method of follow-up action should be careful not to overadjust, because the commission costs would become prohibitive. A more detailed description of the use of deltas as a means of follow-up action is contained in Chapter 28 on mathematical applications, under the heading "Facilitation or Institutional Block Positioning." The general concept, however, is the same as that shown earlier for ratio writing.

Example: Early in this chapter, when selection criteria were described, a neutral ratio was determined to be 16:10, with XYZ at 44. Suppose, after establishing the spread, that the common rallied to 47. One could use the current deltas to adjust. This information is summarized in Table 11-4. The current neutral ratio is approximately 14:10. Thus, two of the short April 45's could be bought closing. In practice, one usually decreases his ratio by adding to the long side. Consequently, one would buy two April 40's, decreasing his overall ratio to 16:12, which is 1.33 and is close to the actual neutral ratio of 1.38. The position would therefore be delta-neutral once more.

An alternative way of looking at this is to use the equivalent stock position (ESP), which, for any option, is the multiple of the quantity times the delta times the shares per

TABLE 11-4.
Original and current prices and deltas.

	Original Situation	Current Situation
XYZ common	44	47
April 40 call	5	8
April 45 call	3	5
April 40 delta	.80	.90
April 45 delta	.50	.65
Neutral ratio	16:10 (.80/.50)	14:10 (.90/.65 = 1.38)
April 40 ESP	800 long (10 × .8 × 100)	900 long (10 × .9 × 100)
April 45 ESP	800 shrt (16 × .5 × 100)	1,040 shrt (16 × .65 × 100)
Total ESP	0 (neutral)	140 shrt

option. The last three lines of Table 11-4 show the ESP for each call and for the position as a whole. Initially, the position has an ESP of 0, indicating that it is perfectly delta-neutral. In the current situation, however, the position is delta short 140 shares. Thus, one could adjust the position to be delta-neutral by buying 140 shares of XYZ. If he wanted to use the options rather than the stock, he could buy two April 45's, which would add a delta long of 130 ESP (2 × .65 × 100), leaving the position delta short 10 shares, which is very near neutral. As pointed out in the above paragraph, the spreader probably should buy the call with the most intrinsic value—the April 40. Each one of these has an ESP of 90 (1 × .9 × 100). Thus, if one were bought, the position would be delta short 50 shares; if two were bought, the total position would be delta *long* 40 shares. It would be a matter of individual preference whether the spreader wanted to be long or short the "odd lot" of 40 or 50 shares, respectively.

The ESP method is merely a confirmation of the other method. Either one works well. The spreader should become familiar with the ESP method because, in a position with many different options, it reduces the exposure of the entire position to a single number.

TAKING PROFITS

In addition to defensive action, the spreader may find that he can close the spread early to take a profit or to limit losses. If enough time has passed and the underlying stock is close to the maximum profit point—the higher striking price—the spreader may want to consider closing the spread and taking his profit. Similarly, if the underlying stock is somewhere between the two strikes as expiration draws near, the writer will normally find himself with a profit as the long call retains some intrinsic value and the short calls

are nearly worthless. If at this time one feels that there is little to gain (a price decline might wipe out the long call value), he should close the spread and take his profit.

SUMMARY

Ratio spreads can be an attractive strategy, similar in some ways to ratio writing. Both strategies offer a large probability of making a limited profit. The ratio spread has limited downside risk, or possibly no downside risk at all. In addition, if the long call(s) in the spread can be bought with little or no time value premium in them, the ratio spread becomes a superior strategy to the ratio write. One can adjust the ratio used to reflect his opinion of the underlying stock or to make a neutral profit range if desired. The ratio adjustment can be accomplished by using the deltas of the options. In a broad sense, this is one of the more attractive forms of spreading, since the strategist is buying mostly intrinsic value and is selling a relatively large amount of time value.

CHAPTER 12

Combining Calendar and Ratio Spreads

The previous chapters on spreading introduced the basic types of spreads. The simplest forms of bull spreads, bear spreads, or calendar spreads can often be combined to produce a position with a more attractive potential. The butterfly spread, which is a combination of a bull spread and a bear spread, is an example of such a combination. The next three chapters are devoted to describing other combinations of spreads, wherein the strategist not only mixes basic strategies—bull, bear, and calendar—but uses varying expiration dates as well. Although they may seem overly complicated at first glance, these combinations are often employed by professionals in the field.

RATIO CALENDAR SPREAD

The *ratio calendar spread* is a combination of the techniques used in the calendar and ratio spreads. Recall that one philosophy of the calendar spread strategy was to sell the near-term call and buy a longer-term call, with both being out-of-the-money. This is a bullish calendar spread. If the underlying stock never advances, the spreader loses the entire amount of the relatively small debit that he paid for the spread. However, if the stock advances after the near-term call expires worthless, large profits are possible. It was stated that this bullish calendar spread philosophy had a small probability of attaining large profits, and that the few profits could easily exceed the preponderance of small losses.

The ratio calendar spread is an attempt to raise the probabilities while allowing for large potential profits. *In the ratio calendar spread, one sells a number of near-term calls*

while buying fewer of the intermediate-term or long-term calls. Since more calls are being sold than are being bought, naked options are involved. It is often possible to set up a ratio calendar spread for a credit, meaning that if the underlying stock never rallies above the strike, the strategist will still make money. However, since naked calls are involved, the collateral requirements for participating in this strategy may be large.

Example: As in the bullish calendar spreads described in Chapter 9, the prices are:

XYZ common, 45;
XYZ April 50 call, 1; and
XYZ July 50 call, 1.50.

In the bullish calendar spread strategy, one July 50 is bought for each April 50 sold. This means that the spread is established for a debit of 50 cents and that the investment is $50 per spread, plus commissions. The strategist using the ratio calendar spread has essentially the same philosophy as the bullish calendar spreader: The stock will remain below 50 until April expiration and may then rally. The ratio calendar spread might be set up as follows:

Buy 1 XYZ July 50 call at 1½	1.50 debit
Sell 2 XYZ April 50 calls at 1 each	2 credit
Net	.50 credit

Although there is no cash involved in setting up the ratio spread since it is done for a credit, there is a collateral requirement for the naked April 50 call.

If the stock remains below 50 until April expiration, the long call—the July 50—will be owned free. After that, no matter what happens to the underlying stock, the spread cannot lose money. In fact, if the underlying stock advances dramatically after near-term expiration, large profits will accrue as the July 50 call increases in value. Of course, this is entirely dependent on the near-term call expiring worthless. If the underlying stock should rally above 50 before the April calls expire, the ratio calendar spread is in danger of losing a large amount of money because of the naked calls, and defensive action must be taken. Follow-up actions are described later.

The collateral required for the ratio calendar spread is equal to the amount of collateral required for the naked calls less the credit taken in for the spread. Since naked calls will be marked to market as the stock moves up, *it is always best to allow enough collateral to get to a defensive action point.* In the example above, suppose that one felt he would definitely be taking defensive action if the stock rallied to 53 before April expira-

tion. He should then figure his collateral requirement as if he stock were at 53, regardless of what the collateral requirement is at the current time. *This is a prudent tactic whenever naked options are involved, since the strategist will never be forced into an unwanted close-out before his defensive action point is reached.* The collateral required for this example would then be as follows, assuming the call is trading at 3½:

20% of 53	$1,060
Call premium	+ 350
Less initial credit	– 50
Total collateral to set aside	$1,360

The strategist is not really "investing" anything in this strategy, because his requirement is in the form of collateral, not cash. That is, his current portfolio assets need not be disturbed to set up this spread, although losses would, of course, create debits in the account. Many naked option strategies are similar in this respect, and the strategist may earn additional money from the collateral value of his portfolio without disturbing the portfolio itself. However, he should take care to operate such strategies in a conservative manner, since any income earned is "free," but losses may force him to disturb his portfolio. In light of this fact, it is always difficult to compute returns on investment in a strategy that requires only collateral to operate. One can, of course, compute the return on the maximum collateral required during the life of the position. The large investor participating in such a strategy should be satisfied with any sort of positive return.

Returning to the example above, the strategist would make his $50 credit, less commissions, if the underlying stock remained below 50 until July expiration. It is not possible to determine the results to the upside so definitively. If the April 50 calls expire worthless and then the stock rallies, the potential profits are limited only by time. The case in which the stock rallies before April expiration is of the most concern. If the stock rallies *immediately*, the spread will undoubtedly show a loss. If the stock rallies to 50 more slowly, but still before April expiration, it is possible that the spread will not have changed much. Using the same example, suppose that XYZ rallies to 50 with only a few weeks of life remaining in the April 50 calls. Then the April 50 calls might be selling at 1.50 while the July 50 call might be selling at 3. The ratio spread could be closed for even money at that point; the cost of buying back the 2 April 50's would equal the credit received from selling the one July 50. He would thus make .50, less commissions, on the entire spread transaction. Finally, at the expiration date of the April 50 calls, one can estimate where he would break even. Suppose one estimated that the July 50 call would be selling for 5.50 points if XYZ were at 53 at April expiration. Since the April 50 calls would be selling for 3 at that time (they would be at parity), there would be a debit of 50 cents to close the ratio spread.

The two April 50 calls would be bought for 6 points and the July 50 call sold for 5.50—a .50 debit. The entire spread transaction would thus have broken even, less commissions, at 53 at April expiration, since the spread was put on for a .50 credit and was taken off for a .50 debit. *The risk to the upside depends clearly, then, on how quickly the stock rallies above 50 before April expiration.*

CHOOSING THE SPREAD

Some of the same criteria used in setting up a bullish calendar spread apply here as well. Select a stock that is volatile enough to move above the striking price in the allotted time—after the near-term expires, but before the long call expires. Do not use calls that are so far out-of-the-money that it would be virtually impossible for the stock to reach the striking price. Always set up the spread for a credit, commissions included. This will assure that a profit will be made even if the stock goes nowhere. However, if the credit has to be generated by using an extremely large ratio—greater than 3 short calls to every long one—one should probably reject that choice, since the potential losses in an immediate rally would be large.

The *upside break-even point* prior to April expiration should be determined using a pricing model. Such a model, or the output from one, can generally be obtained from a data service or from some brokerage firms. It is useful to the strategist to know exactly how much room he has to the upside if the stock begins to rally. This will allow him to take defensive action in the form of closing out the spread before his break-even point is reached. Since a pricing model can estimate a call price for any length of time, the strategist can compute his break-even points at April expiration, 1 month before April expiration, 6 weeks before, and so on. When the long option in a spread expires at a different time from the short option, the break-even point is dynamic. That is, it changes with time. Table 12-1 shows how this information might be accumulated for the example spread used above. Since this example spread was established for a .50-point credit with the stock at 45, the break-even points would be at stock prices where the spread could be removed for a .50-point debit. Suppose the spread was initiated with 95 days remaining until April expiration. In each line of the table, the cost for buying 2 April 50's is .50 more than the price of the July 50. That is, there would be a .50-point debit involved in closing the spread at those prices. Notice that *the break-even price increases as time passes.* Initially, the spread would show a loss if the stock moved up at all. This is to be expected, since an immediate move would not allow for any erosion in the time value premium of the near-term calls. As more and more time passes, time weighs more heavily on the near-term April calls than on the longer-term July call. Once the strategist has this information, he might then look at a chart

of the underlying stock. If there is resistance for XYZ below 53, his eventual break-even point at April expiration, he could then feel more confident about this spread.

FOLLOW-UP ACTION

The main purpose of defensive action in this strategy is to limit losses if the stock should rally before April expiration. The strategist should be quick to close out the spread before any serious losses accrue. The long call quite adequately compensates for the losses on the short calls up to a certain point, a fact demonstrated in Table 12-1. However, the stock cannot be allowed to run. A rule of thumb that is often useful is to close the spread if the stock breaks out above technical resistance or if it breaks above the eventual break-even point at expiration. In the example above, the strategist would close the spread if, at any time, XYZ rose above 53 (before April expiration, of course).

If a significant amount of time has passed, the strategist might act even more quickly in closing the spread. As was shown earlier, if the stock rallies to 50 with only a few weeks of time remaining, the spread may actually be at a slight profit at that time. It is often the best course of action to take the small profit, if the stock rises above the striking price.

TABLE 12-1.
Break-even points changing over time.

Days Remaining until April Expiration	Break-Even Point (Stock Price)	Estimated April 50 Price	Estimated July 50 Price
90	45	1	1.50
60	48	1.50	2.50
30	51	2.50	4.50
0	53	3	5.50

THE PROBABILITIES ARE GOOD

This is a strategy with a rather large probability of profit, provided that the defensive action described above is adhered to. The spread will make money if the stock never rallies above the striking price, since the spread is established for a credit. This in itself is a rather high-probability event, because the stock is initially below the striking price. In addition, the spread can make large potential profits if the stock rallies after the near-term calls expire. Although this is a much less probable event, the profits that can accrue add

to the expected return of the spread. The only time the spread loses is when the stock rallies quickly, and the strategist should close out the spread in that case to limit losses.

Although Table 12-2 is not mathematically definitive, it can be seen that this strategy has a positive expected return. Small profits occur more frequently than small losses do, and sometimes large profits can occur. These expected outcomes, when coupled with the fact that the strategist may utilize collateral such as stocks, bonds, or government securities to set up these spreads, demonstrate that this is a viable strategy for the advanced investor.

TABLE 12-2.
Profitability of ratio calendar spreading.

Event	Outcome	Probability
Stock never rallies above strike	Small profit	Large probability
Stock rallies above strike in a short time	Small loss if defensive action employed	Small probability
Stock rallies above strike after near-term call expires	Large potential profit	Small probability

DELTA-NEUTRAL CALENDAR SPREADS

The preceding discussion dealt with a specific kind of ratio calendar spread, the out-of-the-money call spread. A more accurate ratio can be constructed using the deltas of the calls involved, similar to the ratio spreads in Chapter 11. The spread can be created with either out-of-the-money calls or in-the-money calls. The former has naked calls, while the latter has extra long calls. Both types of ratio calendars are described.

In either case, the number of calls to sell for each one purchased is determined by dividing the delta of the long call by the delta of the short call. This is the same for any ratio spread, not just calendars.

Example: Suppose XYZ is trading at 45 and one is considering using the July 50 call and the April 50 call to establish a ratio calendar spread. This is the same situation that was described earlier in this chapter. Furthermore, assume that the deltas of the calls in question are .25 for the July and .15 for the April. Given that information, one can compute the neutral ratio to be 1.667 to 1 (.25/.15). That is, one would sell 1.667 calls for each one he bought; restated, he would sell 5 for each 3 bought.

This out-of-the-money neutral calendar is typical. One normally sells more calls than he buys to establish a neutral calendar when the calls are out-of-the-money. The ramifications

of this strategy have already been described in this chapter. Follow-up strategy is slightly different, though, and is described later.

THE IN-THE-MONEY CALENDAR SPREAD

When the calls are in-the-money, the neutral spread has a distinctly different look. An example will help in describing the situation.

Example: XYZ is trading at 49, and one wants to establish a neutral calendar spread using the July 45 and April 45 calls. The deltas of these in-the-money calls are .8 for the April and .7 for the July. *Note that for in-the-money calls, a shorter-term call has a higher delta than a longer-term call.*

The neutral ratio for this in-the-money spread would be .875 to 1 (.7/.8). This means that .875 calls would be sold for each one bought; restated, 7 calls would be sold and 8 bought. Thus, the spreader is buying more calls than he is selling when establishing an in-the-money neutral calendar. In some sense, one is establishing some "regular" calendar spreads (seven of them, in this example) and simultaneously buying a few extra long calls to go along with them (one extra long call, in this example).

This type of position can be quite attractive. First of all, there is no risk to the upside as there is with the out-of-the-money calendar; the in-the-money calendar would make money, because there are extra long calls in the position. Thus, if there were to be a large gap to the upside in XYZ—perhaps caused by a takeover attempt—the in-the-money calendar would make money. If, on the other hand, XYZ stays in the same area, then the regular calendar spread portion of the strategy will make money. Even though the extra call would probably lose some time value premium in that event, the other seven spreads would make a large enough profit to easily compensate for the loss on the one long call. The least desirable result would be for XYZ to drop precipitously. However, in that case, the loss is limited to the amount of the initial debit of the spread. Even in the case of XYZ dropping, though, follow-up action can be taken. There are no naked calls to margin with this strategy, making it attractive to many smaller investors. In the above example, one would need to pay for the entire debit of the position, but there would be no further requirements.

FOLLOW-UP ACTION

If one decides to preserve a neutral strategy with follow-up action in either type of ratio call calendar, he would merely need to look at the deltas of the calls and keep the ratio neutral. Doing so might mean that one would switch from one type of calendar spread to

the other, from the out-of-the-money with naked calls to the in-the-money with extra long calls, or vice versa. For example, if XYZ started at 45, as in the first example, one would have sold more calls than he bought. If XYZ then rallied above 50, he would have to move his position into the in-the-money ratio and get long more calls than he is short.

While such follow-up action is strategically correct—maintaining the neutral ratio—it might not make sense practically, especially if the size of the original spread were small. If one had originally sold 5 and bought 3, he would be better to adhere to the follow-up strategy outlined earlier in this chapter. The spread is not large enough to dictate adjusting via the delta-neutral ratios. If, however, a large trader had originally sold 500 calls and bought 300, then he has enough profitability in the spread to make several adjustments along the way.

In a similar manner, the spreader who had established a small in-the-money calendar might decide not to bother ratioing the spread if the stock dropped below the strike. He knows his risk is limited to his initial debit, and that would be small for a small spread. He might not want to introduce naked options into the position if XYZ declines. However, if the same spread were established by a large trader, it should be adjusted because of the greater tolerance of the spread to being adjusted, merely because of its size.

CHAPTER 13

Reverse Spreads

In general, when a strategy has the term "reverse" in its name, the strategy is the opposite of a more commonly used strategy. The reader should be familiar with this nomenclature from the earlier discussions comparing ratio writing (buying stock and selling calls) with reverse hedging (shorting stock and buying calls). If the reverse strategy is sufficiently well-known, it usually acquires a name of its own. For example, the bear spread is really the reverse of the bull spread, but the bear spread is a popular enough strategy in its own right to have acquired a shorter, unique name.

REVERSE CALENDAR SPREAD

The reverse calendar spread is an infrequently used strategy, at least for public customers trading stock or index options, because of the margin requirements. However, even then, it *does* have a place in the arsenal of the option strategist. Meanwhile, professionals and futures option traders use the strategy with more frequency because the margin treatment is more favorable for them.

As its name implies, the reverse calendar spread is a position that is just the opposite of a "normal" calendar spread. In the *reverse* calendar spread, one sells a long-term call option and simultaneously buys a shorter-term call option. The spread can be constructed with puts as well, as will be shown in a later chapter. Both calls have the same striking price.

This strategy will make money if one of two things happens: Either (1) the stock price moves away from the striking price by a great deal, or (2) the implied volatility of the options involved in the spread shrinks. For readers familiar with the "normal" calendar spread strategy, the first way to profit should be obvious, because a "normal" calendar spread makes the most money if the stock is right at the strike price at expiration, and it loses money if the stock rises or falls too far.

As with any spread involving options expiring in differing months, it is common practice to look at the profitability of the position at or before the near-term expiration. An example will show how this strategy can profit.

Example: Suppose the current month is April and that XYZ is trading at 80. Furthermore, suppose that XYZ's options are quite expensive, and one believes the underlying stock will be volatile. A reverse calendar spread would be a way to profit from these assumptions. The following prices exist:

XYZ December 80 call:	12
XYZ July 80 call:	7

A reverse calendar spread is established by *selling* the December 80 call for 12 points, and buying the July 80 call for 7, a net credit of 5 points for the spread.

If, later, XYZ falls dramatically, both call options will be nearly worthless and the spread could be bought back for a price well below 5. For example, if XYZ were to fall to 50 in a month or so, the July 80 call would be nearly worthless and the December 80 call could be bought back for about a point. Thus, the spread would have shrunk from its initial price of 5 to a price of about 1, a profit of 4 points.

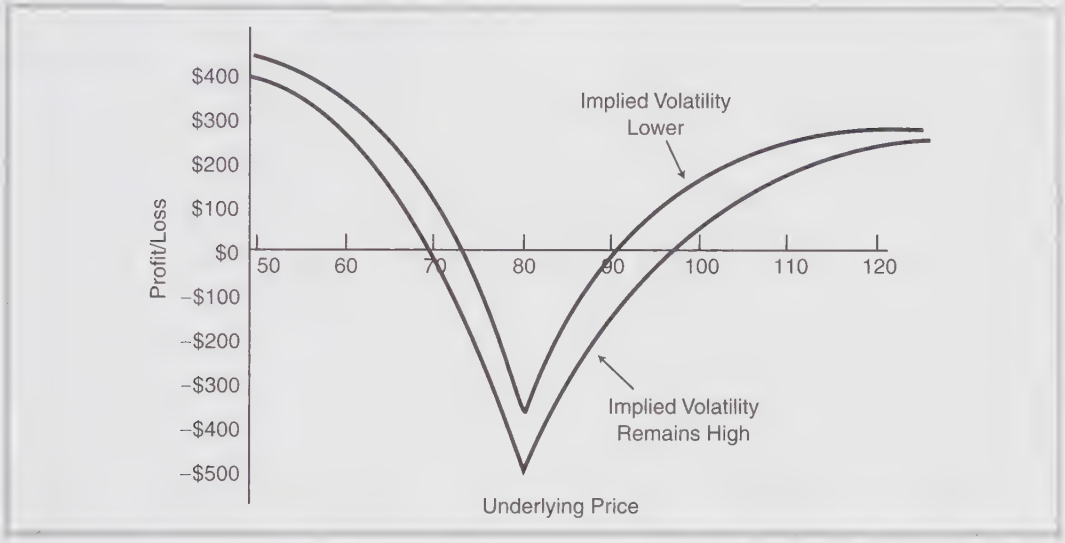
The other way to make money would be for implied volatility to decrease. Suppose implied volatility dropped after a month had passed. Then the spread might be worth something like 4 points—an unrealized profit of about 1 point, since it was sold for a price of 5 initially.

The profit graph in Figure 13-1 shows the profitability of the reverse calendar. There are two lines on the graph, both of which depict the results at the expiration of the near-term option (the July 80 call in the above example). The lower line shows where profits and losses would occur if implied volatility remained unchanged. You can see that the position could profit if XYZ were to rise above 98 or fall below 70. In addition, the higher curve on the graph shows where profits would lie if implied volatility *fell* prior to expiration of the near-term options. In that case, additional profits would accrue, as depicted on the graph.

So there are two ways to make money with this strategy, and it is therefore best to establish it when implied volatility is high *and* the underlying has a tendency to be volatile.

The problem with this spread, for stock and index option traders, is that the call that is sold is considered to be naked. This is preposterous, of course, since the short-term call is a perfectly valid hedge until it expires. Yet the margin requirements remain onerous. When they were overhauled recently, this glaring inefficiency was allowed to stand because none of the member firms cared about changing it. Still, if one has excess collateral—perhaps from a large stock portfolio—and is interested in generating excess

FIGURE 13-1.
Calendar spread sale at near-term expiration.



income in a hedged manner, then the strategy might be applicable for him as well. Futures option traders receive more favorable margin requirements, and it thus might be a more economical strategy for them.

REVERSE RATIO SPREAD (BACKSPREAD)

A more popular reverse strategy is the *reverse ratio call spread, which is commonly known as a backspread.* In this type of spread, one would sell a call at one striking price and then would buy several calls at a higher striking price. This is exactly the opposite of the ratio spread described in Chapter 11. Some traders refer to any spread with unlimited profit potential on at least one side as a backspread. Thus, in most backspreading strategies, *the spreader wants the stock to move dramatically.* He does not generally care whether it moves up or down. Recall that in the reverse hedge strategy (similar to a straddle buy) described in Chapter 4, the strategist had the potential for large profits if the stock moved either up or down by a great deal. In the backspread strategy discussed here, large potential profits exist if the stock moves up dramatically, but there is limited profit potential to the downside.

Example: XYZ is selling for 43 and the July 40 call is at 4, with the July 45 call at 1. A reverse ratio spread would be established as follows:

Buy 2 July 45 calls at 1 each	2 debit
Sell 1 July 40 call at 4	4 credit
Net	2 credit

These spreads are generally established for credits. In fact, *if the spread cannot be initiated at a credit, it is usually not attractive.* If the underlying stock drops in price and is below 40 at July expiration, all the calls will expire worthless and the strategist will make a profit equal to his initial credit. The maximum *downside* potential of the reverse ratio spread is equal to the initial credit received. On the other hand, if the stock rallies substantially, the potential upside profits are unlimited, since the spreader owns more calls than he is short. *Simplistically, the investor is bullish and is buying out-of-the-money calls but is simultaneously hedging himself by selling another call.* He can profit if the stock rises in price, as he thought it would, but he also profits if the stock collapses and all the calls expire worthless.

This strategy has limited risk. *With most spreads, the maximum loss is attained at expiration at the striking price of the purchased call.* This is a true statement for backspreads.

Example: If XYZ is at exactly 45 at July expiration, the July 45 calls will expire worthless for a loss of $200 and the July 40 call will have to be bought back for 5 points, a $100 loss on that call. The total loss would thus be $300, and this is the most that can be lost in this example. If the underlying stock should rally dramatically, this strategy has unlimited profit potential, since there are two long calls for each short one. In fact, one can always compute the upside break-even point at expiration. That break-even point happens to be 48 in this example. At 48 at July expiration, each July 45 call would be worth 3 points, for a net gain of $400 on the two of them. The July 40 call would be worth 8 with the stock at 48 at expiration, representing a $400 loss on that call. Thus, the gain and the loss are offsetting and the spread breaks even, except for commissions, at 48 at expiration. If the stock is higher than 48 at July expiration, profits will result.

Table 13-1 and Figure 13-2 depict the potential profits and losses from this example of a reverse ratio spread. Note that the profit graph is exactly like the profit graph of a ratio spread that has been rotated around the stock price axis. Refer to Figure 11-1 for a graph of the ratio spread. There is actually a range outside of which profits can be made—below 42 or above 48 in this example. The maximum loss occurs at the striking price of the purchased calls, or 45, at expiration.

There are no naked calls in this strategy, so *the investment is relatively small.* The strategy is actually a long call added to a bear spread. In this example, the bear

TABLE 13-1.
Profits and losses for reverse ratio spread.

XYZ Price at July Expiration	Profit on 1 July 40	Profit on 2 July 45's	Total Profit
35	+$ 400	–$ 200	+$ 200
40	+ 400	– 200	+ 200
42	+ 200	– 200	0
45	– 100	– 200	– 300
48	– 400	+ 400	0
55	– 1,100	+ 1,800	+ 700
70	– 2,600	+ 4,800	+ 2,200

spread portion is long the July 45 and short the July 40. This requires a $500 collateral requirement, because there are 5 points difference in the striking prices. The credit of $200 received for the entire spread can be applied against the initial requirement, so that the total requirement would be $300 plus commissions. There is no increase or decrease in this requirement, since there are no naked calls.

Notice that *the concept of a delta-neutral spread can be utilized in this strategy*, in much the same way that it was used for the ratio call spread. The number of calls to buy and sell can be computed mathematically by using the deltas of the options involved.

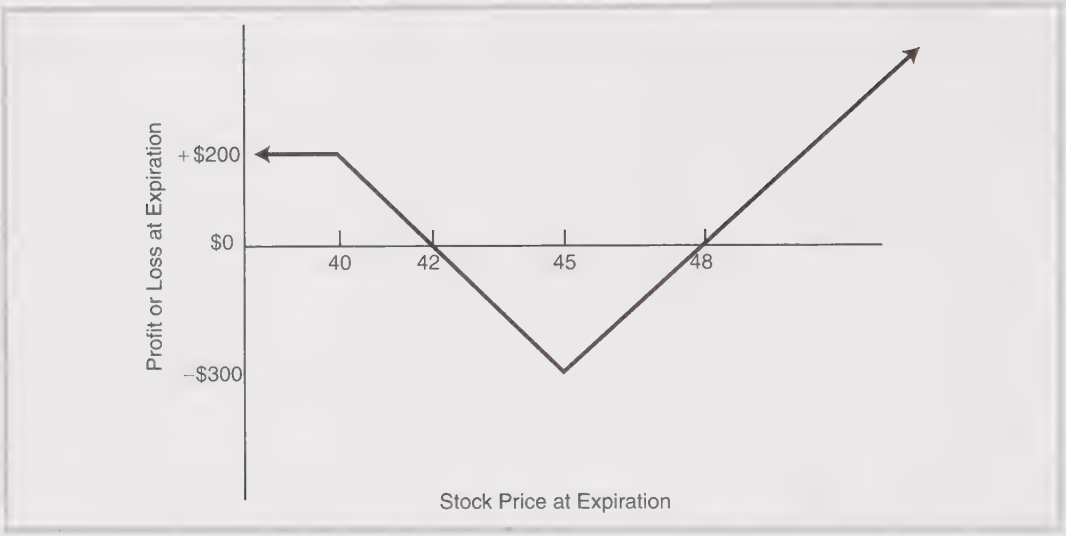
Example: The neutral ratio is determined by dividing the delta of the July 45 into the delta of the July 40.

Prices		Delta
XYZ common:	=43	
XYZ July 40 call:	4	.80
XYZ July 45 call:	1	.35

In this case, that would be a ratio of 2.29:1 (.80/.35). That is, if one sold 5 July 40's, he would buy 11 July 45's (or if he sold 10, he would then buy 23). By beginning with a neutral ratio, the spreader should be able to make money on a quick move by the stock in either direction.

The neutral ratio can also help the spreader to avoid being too bearish or too bullish to begin with. For example, a spreader would not be bullish enough if he merely used a 2:1 ratio for convenience, instead of using the 2.3:1 ratio. If anything, one might normally

FIGURE 13-2.
Reverse ratio spread (backspread).



establish the spread with an extra bullish emphasis, since the largest profits are to the upside. There is little reason for the spreader to have too little bullishness in this strategy. Thus, if the deltas are correct, the neutral ratio can aid the spreader in the determination of a more accurate initial ratio.

The strategist must be alert to the possibility of early exercise in this type of spread, since he has sold a call that is in-the-money. Aside from watching for this possibility, there is little in the way of defensive follow-up action that needs to be implemented, since the risk is limited by the nature of the position. He might take profits by closing the spread if the stock rallies before expiration.

This strategy presents a reasonable method of attempting to capitalize on a large stock movement with little tie-up of collateral. *Generally, the strategist would seek out volatile stocks* for implementation of this strategy, because he would want as much potential movement as possible by the time the calls expire. In Chapter 14, it will be shown that this strategy can become more attractive by buying calls with a longer maturity than the calls sold.

CHAPTER 14

Diagonalizing a Spread

When one uses both different striking prices and different expiration dates in a spread, it is a diagonal spread. Generally, the long side of the spread would expire later than the short side of the spread. Note that this is within the definition of a spread for margin purposes: The long side must have a maturity equal to or longer than the maturity of the short side. With the exception of calendar spreads, all the previous chapters on spreads have described ones in which the expiration dates of the short call and the long call were the same. However, any of these spreads can be diagonalized; one can replace the long call in any spread with one expiring at a later date.

In general, *diagonalizing a spread in this manner makes it slightly more bearish at near-term expiration.* This can be seen by observing what would happen if the stock fell or rose substantially. If the stock falls, the long side of the spread will retain some value because of its longer maturity. Thus, a diagonal spread will generally do better to the downside than will a regular spread. If the stock rises substantially, all calls will come to parity. Thus, there is no advantage in the long-term call; it will be selling for approximately the same price as the purchased call in a normal spread. However, since the strategist had to pay more originally for the longer-term call, his upside profits would not be as great.

A diagonalized position has an advantage in that one can reestablish the position if the written calls expire worthless in the spread. Thus, the increased cost of buying a longer-term call initially may prove to be a savings if one can write against it twice. These tactics are described for various spread strategies.

THE DIAGONAL BULL SPREAD

A vertical call bull spread consists of buying a call at a lower striking price and selling a call at a higher striking price, both with the same expiration date. *The diagonal bull*

spread would be similar except that one would buy a longer-term call at the lower strike and would sell a near-term call at the higher strike. The number of calls long and short would still be the same. By diagonalizing the spread, the position is hedged somewhat on the downside in case the stock does not advance by near-term expiration. Moreover, once the near-term option expires, the spread can often be reestablished by selling the call with the next maturity.

Example: The following prices exist:

	Strike	April	July	October	Stock Price
XYZ	30	3	4	5	32
XYZ	35	1	1.50	2	32

A vertical bull spread could be established in any of the expiration series by buying the call with 30 strike and selling the call with 35 strike. A diagonal bull spread would consist of buying the July 30 or October 30 and selling the April 35. To compare a vertical bull spread with a diagonal spread, the following two spreads will be used:

Vertical bull spread: buy the April 30 call, sell the April 35—2 debit
Diagonal bull spread: buy the July 30 call, sell the April 35—3 debit

The vertical bull spread has a 3-point potential profit if XYZ is above 35 at April expiration. The maximum risk in the normal bull spread is 2 points (the original debit) if XYZ is anywhere below 30 at April expiration. By diagonalizing the spread, the strategist lowers his potential profit slightly at April expiration, but also lowers the probability of losing 2 points in the position. Table 14-1 compares the two types of spreads at April expiration. The price of the July 30 call is estimated in order to derive the estimated profits or losses from the diagonal bull spread at that time. If the underlying stock drops too far—to 20, for example—both spreads will experience nearly a total loss at April expiration. However, the diagonal spread will not lose its entire value if XYZ is much above 24 at expiration, according to Table 14-1. The diagonal spread actually has a smaller dollar loss than the normal spread between 27 and 32 at expiration, despite the fact that the diagonal spread was more expensive to establish. On a percentage basis, the diagonal spread has an even larger advantage in this range. If the stock rallies above 35 by expiration, the normal spread will provide a larger profit. There is an interesting characteristic of the diagonal spread that is shown in Table 14-1. If the stock advances substantially and all the calls come to parity, the profit on the diagonal spread is limited to 2 points. However, if the stock is near 35 at April expiration, the long call will have some time premium in it

TABLE 14-1.
Comparison of spreads at expiration.

XYZ Price at April Expiration	April 30 Price	April 35 Price	July 30 Price	Vertical Bull Spread Profit	Diagonal Spread Profit
20	0	0	0	–$200	–$300
24	0	0	.50	– 200	– 250
27	0	0	1	– 200	– 200
30	0	0	2	– 200	– 100
32	2	0	3	0	0
35	5	0	5.50	+ 300	+ 250
40	10	5	10	+ 300	+ 200
45	15	10	15	+ 300	+ 200

and the spread will actually widen to more than 5 points. Thus, *the maximum area of profit at April expiration for the diagonal spread is to have the stock near the striking price of the written call.* The figures demonstrate that the diagonal spread gives up a small portion of potential upside profits to provide a hedge to the downside.

Once the April 35 call expires, the diagonal spread can be closed. However, if the stock is below 35 at that time, it may be more prudent to then sell the July 35 call against the July 30 call that is held long. This would establish a normal bull spread for the 3 months remaining until July expiration. Note that if XYZ were still at 32 at April expiration, the July 35 call might be sold for 1 point if the stock's volatility was about the same. This should be true, since the April 35 call was worth 1 point with the stock at 32 three months before expiration. Consequently, the strategist who had pursued this course of action would end up with a normal July bull spread for a net debit of 2 points: He originally paid 4 for the July 30 call, but then sold the April 35 for 1 point and subsequently sold the July 35 for 1 point. By looking at the table of prices for the first example in this chapter, the reader can see that it would have cost 2.50 points to set up the normal July bull spread originally. Thus, by diagonalizing and having the near-term call expire worthless, the strategist is able to acquire the normal July bull spread at a cheaper cost than he could have originally. This is a specific example of how *the diagonalizing effect can prove beneficial if the writer is able to write against the same long call two times*, or three times if he originally purchased the longest-term call. In this example, if XYZ were anywhere between 30 and 35 at April expiration, the spread would be converted to a normal July bull spread. If the stock were above 35, the spread should be closed to take the profit. Below 30, the July 30 call would probably be closed or left outright long.

In summary, the diagonal bull spread may often be an improvement over the normal bull spread. The diagonal spread is an improvement when the stock remains relatively unchanged or falls, up until the near-term written call expires. At that time, the spread can be converted to a normal bull spread if the stock is at a favorable price. Of course, if at any time the underlying stock rises above the higher striking price at an expiration date, the diagonal spread will be profitable.

OWNING A CALL FOR "FREE"

Diagonalization can be used in other spread strategies to accomplish much the same purposes already described; but in addition, it may also be possible for the spreader to wind up owning a long call at a substantially reduced cost, possibly even for free.

The easiest way to see this would be to consider a *diagonal bear spread.*

Example: XYZ is at 32 and the near-term April 30 call is selling for 3 points while the longer-term July 35 call is selling for 1.50 points. A diagonal bear spread could be established by selling the April 30 and buying the July 35. This is still a bear spread, because a call with a lower striking price is being sold while a call at a higher strike is being purchased. However, since the purchased call has a longer maturity date than the written call, the spread is diagonalized.

This diagonal bear spread will make money if XYZ falls in price before the near-term April call expires. For example, if XYZ is at 29 at expiration, the written call will expire worthless and the July 35 will still have some value, perhaps .50. Thus, the profit would be 3 points on the April 30, less a 1-point loss on the July 35, for an overall profit of 2 points. The risk in the position lies to the upside, just as in a regular bear spread. If XYZ should advance by a great deal, both options would be at parity and the spread would have widened to 5 points. Since the initial credit was 1.50 points, the loss would be 5 minus 1.50, or 3.50 points in that case. As in all diagonal spreads, the spread will do slightly better to the downside because the long call will hold some value, but it will do slightly worse to the upside if the underlying stock advances substantially.

The reason that a strategist might attempt a diagonal bear spread would *not* be for the slight downside advantage that the diagonalizing effect produces. Rather it would be because he has a chance of *owning* the July 35 *call*—the longer-term call—*for a substantially reduced cost.* In the example, the cost of the July 35 call was 1.50 points and the premium received from the sale of the April 30 call was 3 points. If the spreader can make 1.50 points from the sale of the April 30 call, he will have completely covered the cost of his July option. He can then sit back and hope for a rally by the underlying stock.

If such a rally occurred, he could make unlimited profits on the long side. If it did not, he loses nothing.

Example: Assume that the same spread was established as in the last example. Then, if XYZ is at or below 31.50 at April expiration, the April 30 call can be purchased for 1.50 points or less. Since the call was originally sold for 3, this would represent a profit of at least 1.50 points on the April 30 call. This profit on the near-term option covers the entire cost of the July 35. Consequently, the strategist owns the July 35 for free. If XYZ never rallies above 35, he would make nothing from the overall trade. However, if XYZ were to rally above 35 after April expiration (but before July expiration, of course), he could make potentially large profits. Thus, *when one establishes a diagonal spread for a credit, there is always the potential that he could own a call for free.* That is, the profits from the sale of the near-term call could equal or exceed the original cost of the long call. This is, of course, a desirable position to be in, for if the underlying stock should rally substantially after profits are realized on the short side, large profits could accrue.

DIAGONAL BACKSPREADS

In an analogous strategy, one might buy more than one longer-term call against the short-term call that is sold. Using the foregoing prices, one might sell the April 30 for 3 points and buy 2 July 35's at 1.50 points each. This would be an *even money spread.* The credits equal the debits when the position is established. If the April 30 call expires worthless, which would happen if the stock was below 30 in April, the spreader would own 2 July 35 calls for free. Even if the April 30 does not expire totally worthless, but if some profit can be made on the sale of it, the July 35's will be owned at a reduced cost. In Chapter 13, when reverse spreads were discussed, the strategy in which one sells a call with a lower strike and then buys more calls at a higher strike was termed a reverse ratio spread, or backspread. The strategy just described is merely the *diagonalizing of a backspread.* This is a strategy that is favored by some professionals, because the short call reduces the risk of owning the longer-term calls if the underlying stock declines. Moreover, if the underlying stock advances, the pre-ponderance of long calls with a longer maturity will certainly outdistance the losses on the written call. The worst situation that could result would be for the underlying stock to rise very slightly by near-term expiration. If this happened, it might be possible to lose money on both sides of the spread. This would have to be considered a rather low-probability event, though, and would still represent a limited loss, so it does not substantially offset the positive aspects of the strategy.

Any type of spread may be diagonalized. There are some who prefer to diagonalize even butterfly spreads, figuring that the extra time to maturity in the purchased calls will

be of benefit. Overall, the benefits of diagonalizing can be generalized by recalling the way in which the decay of the time value premium of a call takes place. Recall that it was determined that a call loses most of its time value premium in the last stages of its life. When it is a very long-term option, the rate of decay is small. Knowing this fact, it makes sense that one would want to sell options with a short life remaining, so that the maximum benefit of the decay could be obtained. Correspondingly, the purchase of a longer-term call would mean that the buyer is not subjecting himself to a substantial loss in time value premium, at least over the first three months of ownership. A diagonal spread encompasses both of these features—selling a short-term call to try to obtain the maximum rate of time decay, while buying a longer-term call to try to lessen the effect of time decay on the long side.

CALL OPTION SUMMARY

This concludes the description of strategies that utilize only call options. The call option has been seen to be a vehicle that the astute strategist can use to set up a wide variety of positions. He can be bullish or bearish, aggressive or conservative. In addition, he can attempt to be neutral, trying to capitalize on the probability that a stock will not move very far in a short time period.

The investor who is not familiar with options should generally begin with a simple strategy, such as covered call writing or outright call purchases. The simplest types of spreads are the bull spread, the bear spread, and the calendar spread. The more sophisticated investor might consider using ratios in his call strategies—ratio writing against stock or ratio spreading using only calls.

Once the strategist feels that he understands the risk and reward relationships between longer-term and short-term calls, between in-the-money and out-of-the-money calls, and between long calls and short calls, he could then consider utilizing the most advanced types of strategies. This might include reverse ratio spreads, diagonal spreads, and more advanced types of ratios, such as the ratio calendar spread.

A great deal of information, some of it rather technical in detail, has been presented in preceding chapters. The best pattern for an investor to follow would be to attempt only strategies that he fully comprehends. This does not mean that he merely understands the profitability aspects (especially the risk) of the strategy. One must also be able to readily understand the potential effects of early assignments, large dividend payments, striking price adjustments, and the like, if he is going to operate advanced strategies. Without a full understanding of how these things might affect one's position, one cannot operate an advanced strategy correctly.

PART III

Put Option Strategies

INTRODUCTION

A *put option* gives the holder the right to *sell* the underlying security at the striking price at any time until the expiration date of the option. Listed put options are slightly newer than listed call options, having been introduced on June 3, 1977. The introduction of listed puts has provided a much wider range of strategies for both conservative and aggressive investors. The call option is least effective in strategies in which downward price movement by the underlying stock is concerned. The put option is a useful tool in that case.

All stocks with listed call options have listed put options as well. The use of puts or the combination of puts and calls can provide more versatility to the strategist.

When listed put options exist, it is no longer necessary to implement strategies involving long calls and short stock. Listed put options can be used more efficiently in such situations. There are many similarities between call strategies and put strategies. For example, put spread strategies and call spread strategies employ similar tactics, although there are technical differences, of course. In certain strategies, the tactics for puts may appear largely to be a repetition of those used for calls, but they are nevertheless spelled out in detail here. The strategies that involve the use of both puts and calls together—straddles and combinations—have techniques of their own, but even in these cases the reader will recognize certain similarities to strategies previously discussed. Thus, the introduction of put options not only widens the realm of potential strategies, but also makes more efficient some of the strategies previously described.

CHAPTER 15

Put Option Basics

Much of the same terminology that is applied to call options also pertains to put options. *Underlying security, striking price,* and *expiration date* are all terms that have the same meaning for puts as they do for calls. The expiration dates of listed put options agree with the expiration dates of the calls on the same underlying stock. In addition, puts and calls have the same striking prices. This means that if there are options at a certain strike, say on a particular underlying stock that has both listed puts and calls, both calls at 50 and puts at 50 will be trading, regardless of the price of the underlying stock. Note that it is no longer sufficient to describe an option as an "XYZ July 50." It must also be stated whether the option is a put or a call, for an XYZ July 50 call and an XYZ July 50 put are two different securities.

In many respects, the put option and its associated strategies will be very nearly the opposite of corresponding call-oriented strategies. However, *it is not correct to say that the put is exactly the opposite of a call.* In this introductory section on puts, the characteristics of puts are described in an attempt to show how they are similar to calls and how they are not.

PUT STRATEGIES

In the simplest terms, *the outright buyer of a put is hoping for a stock price decline* in order for his put to become more valuable. If the stock were to decline well below the striking price of the put option, the put holder could make a profit. The holder of the put could buy stock in the open market and then exercise his put to sell that stock for a profit at the striking price, which is higher.

Example: If XYZ stock is at 40, an XYZ July 50 put would be worth at least 10 points, for the put grants the holder the right to sell XYZ at 50—10 points above its current price.

On the other hand, if the stock price were *above* the striking price of the put option at expiration, the put would be worthless. No one would logically want to exercise a put option to sell stock at the striking price when he could merely go to the open market and sell the stock for a higher price. Thus, *as the price of the underlying stock declines, the put becomes more valuable.* This is, of course, the opposite of a call option's price action.

The meaning of in-the-money and out-of-the-money are altered when one is speaking of put options. *A put is considered to be in-the-money when the underlying stock is below the striking price of the put option; it is out-of-the-money when the stock is above the striking price.* This, again, is the opposite of the call option. If XYZ is at 45, the XYZ July 50 put is in-the-money and the XYZ July 50 call is out-of-the-money. However, if XYZ were at 55, the July 50 put would be out-of-the-money while the July 50 call would be in-the-money. The broad definition of an in-the-money option as "an option that has intrinsic value" would cover the situation for both puts and calls. Note that a put option has intrinsic value when the underlying stock is below the striking price of the put. That is, the put has some "real" value when the stock is below the striking price.

The intrinsic value of an in-the-money put is merely the difference between the striking price and the stock price. Since the put is an option (to sell), it will generally sell for more than its intrinsic value when there is time remaining until the expiration date. This excess value over its intrinsic value is referred to as the *time value premium*, just as is the case with calls.

Example: XYZ is at 47 and the XYZ July 50 put is selling for 5, the intrinsic value is 3 points (50 – 47), so the time value premium must be 2 points. The time value premium of an in-the-money put option can always be quickly computed by the following formula:

$$\begin{matrix}\textit{Time value premium} \\ \text{(in-the-money put)}\end{matrix} = \text{Put option} + \text{Stock price} - \text{Striking price}$$

This is not the same formula that was applied to in-the-money call options, although it is always true that the time value premium of an option is the excess value over intrinsic value.

$$\begin{matrix}\textit{Time value premium} \\ \text{(in-the-money call)}\end{matrix} = \text{Call option} + \text{Striking price} - \text{Stock price}$$

If the put is out-of-the-money, the entire premium of the put is composed of time value premium, for the intrinsic value of an out-of-the-money option is always zero. The *time value premium of a put is largest when the stock is at the striking price of the put.* As the option becomes deeply in-the-money or deeply out-of-the-money, the time value

premium will shrink substantially. These statements on the magnitude of the time value premium are true for both puts and calls. Table 15-1 will help to illustrate the relationship of stock price and option price for both puts and calls. The reader may want to refer to Table 1-1, which described the time value premium relationship for calls. Table 15-1 describes the prices of an XYZ July 50 call option and an XYZ July 50 put option.

Table 15-1 demonstrates several basic facts. As the stock drops, the actual price of a call option decreases while the value of the put option increases. Conversely, as the stock rises, the call option increases in value and the put option decreases in value. Both the put and the call have their maximum time value premium when the stock is exactly at the striking price. However, *the call will generally sell for more than the put when the stock is at the strike.* Notice in Table 15-1 that, with XYZ at 50, the call is worth 5 points while the put is worth only 4 points. This is true in general, except in the case of a stock that pays a large dividend. This phenomenon has to do with the cost of carrying stock. More will be said about this effect later. Table 15-1 also describes an effect of put options that normally holds true: *An in-the-money put (stock is below strike) loses time value premium more quickly than an in-the-money call does.* Notice that with XYZ at 43 in Table 15-1, the put is 7 points in-the-money and has lost all its time value premium. But when the call is 7 points in-the-money, XYZ at 57, the call still has 2 points of time value premium. Again, this is a phenomenon that could be affected by the dividend payout of the underlying stock, but is true in general.

PRICING PUT OPTIONS

The same factors that determine the price of the call option also determine the price of the put option: price of the underlying stock, striking price of the option, time remaining until expiration, volatility of the underlying stock, dividend rate of the underlying stock, and the current risk-free interest rate (Treasury bill rate, for example). Market dynamics—supply, demand, and investor psychology—play a part as well.

Without going into as much detail as was shown in Chapter 1, the pricing curve of the put option can be developed. Certain facts remain true for the put option as they did for the call option. The rate of decay of the put option is not linear; that is, the time value premium will decay more rapidly in the weeks immediately preceding expiration. The more volatile the underlying stock, the higher will be the price of its options, both puts and calls. Moreover, the marketplace may at any time value options at a higher or lower volatility than the underlying stock actually exhibits. This is called implied volatility, as distinguished from actual volatility. Also, the put option is usually worth at least its intrinsic value at any time, and should be worth exactly its intrinsic value on the day that it expires. Figure 15-1 shows where one might expect the XYZ July 50 put to sell, for any

TABLE 15-1.
Call and put options compared.

XYZ Stock Price	XYZ July 50 Call Price	Call Intrinsic Value	Call Time Value Premium	XYZ July 50 Put Price	Put Intrinsic Value	Put Time Value Premium
40	.50	0	.50	9.75	10	–.25*
43	1	0	1	7	7	0
45	2	0	2	6	5	1
47	3	0	3	5	3	2
50	5	0	5	4	0	4
53	7	3	4	3	0	3
55	8	5	3	2	0	2
57	9	7	2	1	0	1
60	10.50	10	.50	.50	0	.50
70	19.75	20	–.25*	.25	0	.25

*A deeply in-the-money option may actually trade at a discount from intrinsic value in advance of expiration.

stock price, if there are 6 months remaining until expiration. Compare this with the similar pricing curve for the call option (Figure 15-2). Note that the *intrinsic value line* for the put option faces in the opposite direction from the intrinsic value line for call options; that is, it gains value as the stock falls below the striking price. This put option pricing curve demonstrates the effect mentioned earlier, that a put option loses time value premium more quickly when it is in-the-money, and also shows that an out-of-the-money put holds a great deal of time value premium.

THE EFFECT OF DIVIDENDS ON PUT OPTION PREMIUMS

The dividend of the underlying stock is a negative factor on the price of its call options. The opposite is true for puts. *The larger the dividend, the more valuable the puts will be.* This is true because, as the stock goes ex-dividend, it will be reduced in price by the amount of the dividend. That is, the stock will decrease in price and therefore the put will become more valuable. Consequently, the buyer of the put will be willing to pay a higher price for the put and the seller of the put will also demand a higher price. As with listed calls, listed puts are not adjusted for the payment of cash dividends on the underlying stock. However, the price of the option itself will reflect the dividend payments on the stock.

FIGURE 15-1.
Put option price curve.

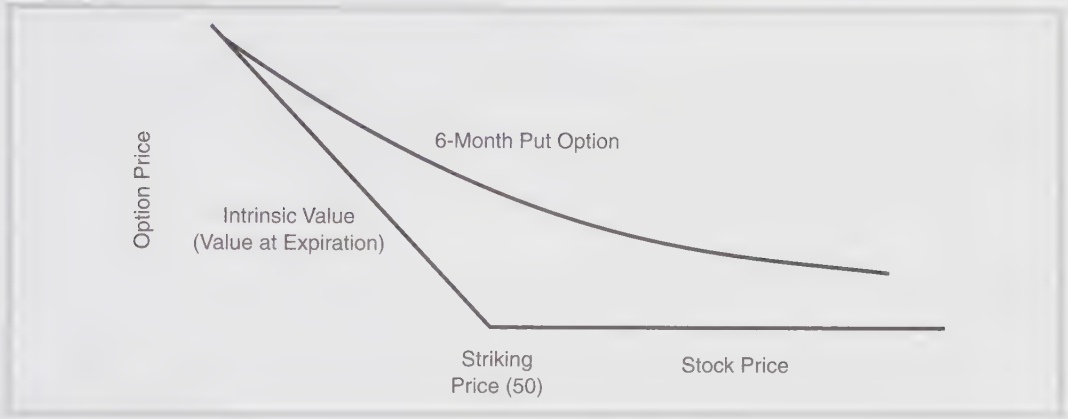
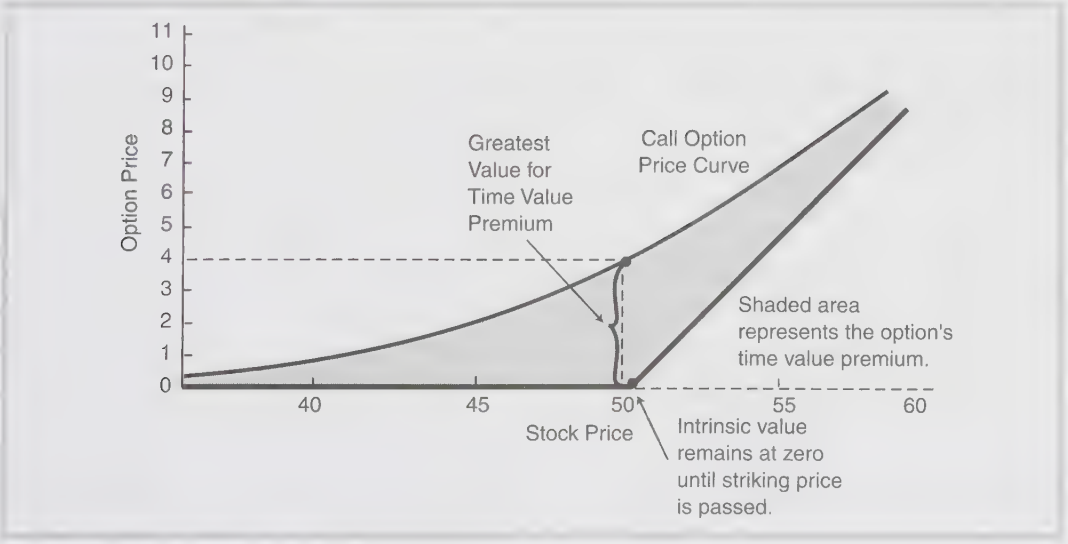


FIGURE 15-2.
Call option price curve.



Example: XYZ is selling for $25 per share and will pay $1 in dividends over the next 6 months. Then a 6-month put option with strike 25 should automatically be worth at least $1, regardless of any other factor concerning the underlying stock. During the next 6 months, the stock will be reduced in price by the amount of its dividends—$1—and if everything else remained the same, the stock would then be at 24. With the stock at 24, the put would be 1 point in-the-money and would thus be worth at least its intrinsic value

of 1 point. Thus, in advance, this large dividend payout of the underlying stock will help to increase the price of the put options on this stock.

On the day before a stock goes ex-dividend, the time value premium of an in-the-money put should be at least as large as the impending cash dividend payment. That is, if XYZ is 40 and is about to pay a $.50 dividend, an XYZ January 50 put should sell for at least 10.50. This is true because the stock will be reduced in price by the amount of its dividend on the day of the ex-dividend.

EXERCISE AND ASSIGNMENT

When the holder of a put option exercises his option, he sells stock at the striking price. He may exercise this right at any time during the life of the put option. When this happens, *the writer of a put option with the same terms is assigned an obligation to buy stock at the striking price.* It is important to notice the difference between puts and calls in this case. The call holder exercises to buy stock and the call writer is obligated to sell stock. The reverse is true for the put holder and writer.

The methods of assignment via the OCC and the brokerage firm are the same for puts and calls; any fair method of random or first-in/first-out assignment is allowed. Stock commissions are charged on both the purchase and sale of the stock via the assignment and exercise.

When the holder of a put option exercises his right to sell stock, he may be selling stock that he currently holds in his portfolio. Second, he may simultaneously go into the open market and buy stock for sale via the put exercise. Finally, he may want to sell the stock in his short stock account; that is, he may short the underlying stock by exercising his put option. He would have to be able to borrow stock and supply the margin collateral for a short sale of stock if he chose this third course of action.

The writer of the put option also has several choices in how he wants to handle the stock purchase that he is required to make. *The put writer who is assigned must receive stock.* (The call writer who is assigned delivery stock.) The put writer may currently be short the underlying stock, in which case he will merely use the receipt of stock from the assignment to cover his short sale. He may also decide to immediately sell stock in the open market to offset the purchase that he is forced to make via the put assignment. Finally, he may decide to retain the stock that is delivered to him; he merely keeps the stock in his portfolio. He would, of course, have to pay for (or margin) the stock if he decides to keep it.

The mechanics as to how the put holder wants to deliver the stock and how the put writer wants to receive the stock are relatively simple. Each one merely notifies his brokerage firm of the way in which he wants to operate and, provided that he can meet the margin requirements, the exercise or assignment will be made in the desired manner.

ANTICIPATING ASSIGNMENT

The writer of a put option can anticipate assignment in the same way that the writer of a call can. *When the time value premium of an in-the-money put option disappears, there is a risk of assignment, regardless of the time remaining until expiration.* In Chapter 1, a form of arbitrage was described in which market-makers or firm traders, who pay little or no commissions, can take advantage of an in-the-money call selling at a discount to parity. Similarly, there is a method for these traders to take advantage of an in-the-money put selling at a discount to parity.

Example: XYZ is at 40 and an XYZ July 50 put is selling for 9.80—a .20 discount from parity. That is, the option is selling for .20 points below its intrinsic value. The arbitrageur could take advantage of this situation through the following actions:

1. Buy the July put at 9.80.
2. Buy XYZ common stock at 40.
3. Exercise the put to sell XYZ at 50.

The arbitrageur makes 10 points on the stock portion of the transaction, buying the common at 40 and selling it at 50 via exercise of his put. He paid 9.80 for the put option and he loses this entire amount upon exercise. However, his overall profit is thus .25 point, the amount of the original discount from parity. Since his commission costs are minimal, he can actually make a net profit on this transaction.

As was the case with deeply in-the-money calls, this type of arbitrage with deeply in-the-money puts provides a secondary market that might not otherwise exist. It allows the public holder of an in-the-money put to sell his option at a price near its intrinsic value. Without these arbitrageurs, there might not be a reasonable secondary market in which public put holders could liquidate.

Dividend payment dates may also have an effect on the frequency of assignment. For call options, the writer might expect to receive an assignment on the day the stock goes ex-dividend. The holder of the call is able to collect the dividend by so exercising. Things are slightly different for the writer of puts. He might expect to receive an assignment on the day after the ex-dividend date of the underlying stock. Since the writer of the put is obligated to buy stock, it is unlikely that anyone would put the stock to him until after the dividend has been paid. In any case, the writer of the put can use a relatively simple gauge to anticipate assignment near the ex-dividend date. If the time value premium of an in-the-money put is less than the amount of the dividend to be paid, the writer may often anticipate that he will be assigned immediately after the ex-dividend of the stock. An example will show why this is true.

Example: XYZ is at 45 and it will pay a $.50 dividend. Furthermore, the XYZ July 50 put is selling at 5.25. Note that the time value premium of the July 50 put is 25 cents—less than the amount of the dividend, which is 50 cents. An arbitrageur could take the following actions:

1. Buy XYZ at 45.
2. Buy the July 50 put at 5.25.
3. Collect the 50-cent dividend (he must hold the stock until the ex-date to collect the dividend).
4. Exercise his put to sell XYZ at 50 (writer would receive assignment on the day after the ex-date).

The arbitrageur makes 5 points on the stock trades, buying XYZ at 45 and selling it at 50 via exercise of the put. He also collects the 50-cent dividend, making his total intake equal to 5.50 points. He loses the 5.25 points that he paid for the put but still has a net profit of 25 cents. Thus, *as the ex-dividend date of a stock approaches, the time value premium of all in-the-money puts on that stock will tend to equal or exceed the amount of the dividend payment.*

This is quite different from the call option. It was shown in Chapter 1 that the call writer only needs to observe whether the call was trading at or below parity, regardless of the amount of the dividend, as the ex-dividend date approaches. The put writer must determine if the time value premium of the put exceeds the amount of the dividend to be paid. If it does, there is a much smaller chance of assignment because of the dividend. In any case, the put writer can anticipate the assignment if he carefully monitors his position.

POSITION LIMITS

Recall that the position limit rule states that one cannot have a position of more than the limit of options on the same side of the market in the same underlying security. The limit varies depending on the trading activity and volatility of the underlying stock and is set by the exchange on which the options are traded. The actual limits are 13,500, 22,500, 31,500, 60,000, or 75,000 contracts, depending on these factors. One cannot have more than 75,000 option contracts on the bullish side of the market—long calls and/or short puts—nor can he have more than 75,000 contracts on the bearish side of the market—short calls and/or long puts. He may, however, have 75,000 contracts on each side of the market: he could simultaneously be long 75,000 calls and long 75,000 puts.

For the following examples, assume that one is concerned with an underlying stock whose position limit is 75,000 contracts.

Long 75,000 calls, long 75,000 puts—no violation; 75,000 contracts bullish (long calls) and 75,000 contracts bearish (long puts).

Long 38,000 calls, short 37,000 puts—no violation; total of 75,000 contracts bullish. Long 38,000 calls, short 38,000 puts–violation; total of 76,000 contracts bullish.

Money managers should be aware that these position limits apply to all "related" accounts, so that someone managing several accounts must total all the accounts' positions when considering the position limit rule.

CONVERSION

Many of the relationships between call prices and put prices relate to a process known as a *conversion*. This term dates back to the over-the-counter option days when a dealer who owned a put (or could buy one) was able to satisfy the needs of a potential call buyer by "converting" the put to a call. This terminology is somewhat confusing, and the actual position that the dealer would take is little more than an arbitrage position. In the listed market, arbitrageurs and firm traders can set up the same position that the converter did.

The actual details of the conversion process, which must include the carrying cost of owning stock and the inclusion of all dividends to be paid by the stock during the time the position is held, are described later. However, it is important for the put option trader to understand what the arbitrageur is attempting to do in order for him to fully understand the relationship between put and call prices in the listed option market.

A conversion position has no risk. The arbitrageur will do three things:

1. Buy 100 shares of the underlying stock.
2. Buy 1 put option at a certain striking price.
3. Sell 1 call option at the same striking price.

The arbitrageur has no risk in this position. If the underlying stock drops, he can always exercise his long put to sell the stock at a higher price. If the underlying stock rises, his long stock offsets the loss on his short call. Of course, the prices that the arbitrageur pays for the individual securities determine whether or not a conversion will be profitable. At times, a public customer may look at prices in the newspaper and see that he could establish a position similar to the foregoing one for a profit, even after commissions. However, unless prices are out of line, the public customer would not normally be able to make a better return than he could by putting his money into a bank or a Treasury bill, because of the commission costs he would pay.

Without needing to understand, at this time, exactly what prices would make an attractive conversion, it is possible to see that it would not always be possible for the arbitrageur to do a conversion. The mere action of many arbitrageurs doing the same conversion would force the prices into line. The stock price would rise because arbitrageurs are buying the stock, as would the put price; and the call price would drop because of the preponderance of sellers.

When this happens, another arbitrage, known as a *reversal (or reverse conversion),* is possible. In this case, the arbitrageur does the opposite: He shorts the underlying stock, sells 1 put, and buys 1 call. Again, this is a position with no risk. If the stock rises, he can always exercise his call to buy stock at a lower price and cover his short sale. If the stock falls, his short stock will offset any losses on his short put.

The point of introducing this information, which is relatively complicated, at this place in the text is to demonstrate that *there is a relationship between put and call prices, when both have the same striking price and expiration date.* They are not independent of one another. If the put becomes "cheap" with respect to the call, arbitrageurs will move in to do conversions and force the prices back in line. On the other hand, if the put becomes expensive with relationship to the call, arbitrageurs will do reversals until the prices move back into line.

Because of the way in which the carrying cost of the stock and the dividend rate of the stock are involved in doing these conversions or reversals, two facts come to light regarding the relationship of put prices and call prices. Both of these facts have to do with the carrying costs incurred during the conversion. First, *a put option will generally sell for less than a call option when the underlying stock is exactly at the striking price,* unless the stock pays a large dividend. In the older over-the-counter option market, it was often stated that the reason for this relationship was that the demand for calls was larger than the demand for puts. This may have been partially true, but certainly it is no longer true in the listed option targets, where a large supply of both listed puts and calls is available through the OCC. Arbitrageurs again serve a useful function in increasing supply and demand where it might not otherwise exist. The second fact concerning the relationship of puts and calls is that a *put option will lose its time value premium much more quickly in-the-money than a call option will* (and, conversely, a put option will generally hold out-of-the-money time value premium better than a call option will). Again, the conversion and reversal processes play a large role in this price action phenomenon of puts and calls. Both of these facts have to do with the carrying costs involved in the conversion.

In the chapter on Arbitrage, exact details of conversions and reversals will be spelled out, with specific reasons why these procedures affect the relationship of put and call prices as stated above. However, at this time, it is sufficient for the reader to understand that there is an arbitrage process that is quite widely practiced that will, in fact, make true the foregoing relationships between puts and calls.

CHAPTER 16

Put Option Buying

The purchase of a put option provides leverage in the case of a downward move by the underlying stock. In this manner, *it is an alternative to the short sale of stock,* much as the purchase of a call option is a leveraged alternative to the purchase of stock.

PUT BUYING VERSUS SHORT SALE

In the simplest case, when an investor expects a stock to decline in price, he may either short the underlying stock or buy a put option on the stock. Suppose that XYZ is at 50 and that an XYZ July 50 put option is trading at 5. If the underlying stock declines substantially, *the buyer of the put could make profits considerably in excess of his initial investment.* However, if the underlying stock rises in price, *the put buyer has limited risk;* he can lose only the amount of money that he originally paid for the put option. In this example, the most that the put buyer could lose would be 5 points, which is equal to his entire initial investment. Table 16-1 and Figure 16-1 depict the results, at expiration, of this simple purchase of the put option.

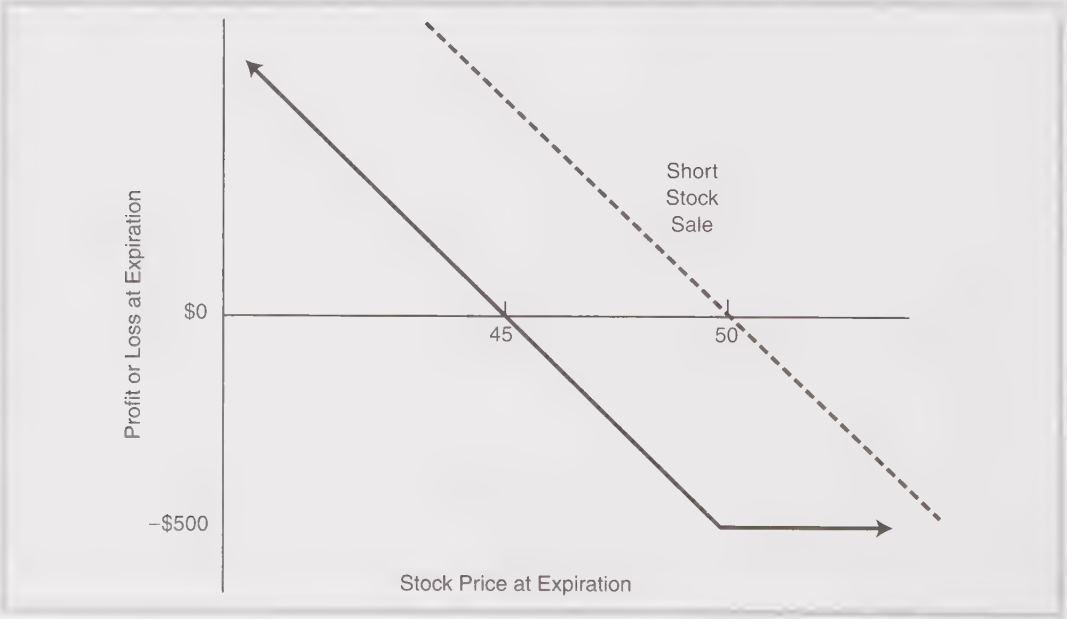
The put buyer has limited profit potential, since a stock can never drop in price below zero dollars per share. However, his potential profits can be huge, percentagewise. His loss, which normally would occur if the stock rises in price, is limited to the amount of his initial investment. *The simplest use of a put purchase is for speculative purposes when expecting a price decline in the underlying stock.*

These results for the profit or loss of the put option purchases can be compared to a similar short sale of XYZ at 50 in order to observe the benefits of leverage and limited risk that the put option buyer achieves. In order to sell short 100 XYZ at 50, assume that the trader would have to use $2,500 in margin. Several points can be verified from Table 16-2 and Figure 16-1. If the stock drops in price sufficiently far, the percentage profits are

TABLE 16-1.
Results of put purchase at expiration.

XYZ Price at Expiration	Put Price at Expiration	Put Option Profit
20	30	+$2,500
30	20	+ 1,500
40	10	+ 500
45	5	0
48	2	– 300
50	0	– 500
60	0	– 500
70	0	– 500

FIGURE 16-1.
Put option purchase.



much greater on the put option purchase than they are on the short sale of the underlying stock. This is the leveraging effect that an option purchase can achieve. If the underlying stock remains relatively unchanged, the short seller would do better because he does not risk losing his entire investment in a limited amount of time if the underlying stock

TABLE 16-2.
Results of selling short.

XYZ Price at Expiration	Short Sale	Put Option Purchase
20	+$3,000 (+120%)	+$2,500 (+ 500%)
30	+ 2,000 (+ 80%)	+ 1,500 (+ 300%)
40	+ 1,000 (+ 40%)	+ 500 (+ 100%)
45	+ 500 (+ 20%)	0 (0%)
48	+ 200 (+ 8%)	– 300 (– 60%)
50	0 (0%)	– 500 (– 100%)
60	– 1,000 (– 40%)	– 500 (– 100%)
75	– 2,500 (–100%)	– 500 (– 100%)
100	– 5,000 (–200%)	– 500 (– 100%)

changes only slightly in price. However, if the underlying stock should rise dramatically, the short seller can actually lose more than his initial investment. The short sale of stock has theoretically unlimited risk. Such is not true of the put option purchase, whereby the risk is limited to the amount of the initial investment. One other point should be made when comparing the purchase of a put and the short sale of stock. The short seller of stock is obligated to pay the dividends on the stock, but the put option holder has no such obligation. This is an additional advantage to the holder of the put.

SELECTING WHICH PUT TO BUY

Many of the same types of analyses that the call buyer goes through in deciding which call to buy can be used by the prospective put buyer as well. First, when approaching put buying as a speculative strategy, one should not place more than 15% of his risk capital in the strategy. Some investors participate in put buying to add some amount of downside protection to their basically bullishly oriented common stock portfolios. More is said in Chapter 17 about buying puts on stocks that one actually owns.

The out-of-the-money put offers both higher reward potentials and higher risk potentials than does the in-the-money put. If the underlying stock drops substantially, the percentage returns from having purchased a cheaper, out-of-the-money put will be greater. However, should the underlying stock decline only moderately in price, the *in-the-money put* will often prove to be the better choice. In fact, since a put option tends

to lose its time value premium quickly as it becomes an in-the-money option, there is an even greater advantage to the purchase of the in-the-money put.

Example: XYZ is at 49 and the following prices exist:

XYZ, 49;
XYZ July 45 put, 1; and
XYZ July 50 put, 3.

If the underlying stock were to drop to 40 by expiration, the July 45 put would be worth 5 points, a 400% profit. The July 50 put would be worth 10 points, a 233% profit over its initial purchase price of 3. Thus, in a substantial downward move, the out-of-the-money put purchase provides higher reward potential. However, if the underlying stock drops only moderately, say to 45, the purchaser of the July 45 put would lose his entire investment, since the put would be worthless at expiration. The purchaser of the in-the-money July 50 put would have a 2-point profit with XYZ at 45 at expiration.

The preceding analysis is based on holding the put until expiration. For the option buyer, this is generally an erroneous form of analysis, because the buyer generally tends to liquidate his option purchase in advance of expiration. When considering what happens to the put option in advance of expiration, it is helpful to remember that an in-the-money put tends to lose its time premium rather quickly. In the example above, the July 45 put is completely composed of time value premium. If the underlying stock begins to drop below 45, the price of the put will not increase as rapidly as would the price of a call that is going into-the-money.

Example: If XYZ fell by 5 points to 44, definitely a move in the put buyer's favor, he may find that the July 45 put has increased in value only to 2 or 2½ points. This is somewhat disappointing because, with call options, one would expect to do significantly better on a 5-point stock movement in his favor. Thus, when purchasing put options for speculation, *it is generally best to concentrate on in-the-money puts unless a very substantial decline in the price of the underlying stock is anticipated.*

Once the put option is in-the-money, the time value premium will decrease even in the longer-term series. Since this time premium is small in all series, the put buyer can often purchase a longer-term option for very little extra money, thus gaining more time to work with. Call option buyers are generally forced to avoid the longer-term series because the extra cost is not worth the risk involved, especially in a trading situation. However, the put buyer does not necessarily have this disadvantage. If he can purchase the longer-term

put for nearly the same price as the near-term put, he should do so in case the underlying stock takes longer to drop than he had originally anticipated it would.

It is not uncommon to see such prices as the following:

XYZ common, 46:
XYZ April 50 put, 4;
XYZ July 50 put, 4.50; and
XYZ October 50 put, 5.

None of these three puts have much time value premium in their prices. Thus, the buyer might be willing to spend the extra 1 point and buy the longest-term put. If the underlying stock should drop in price immediately, he will profit, but not as much as if he had bought one of the less expensive puts. However, should the underlying stock rise in price, he will own the longest-term put and will therefore suffer less of a loss, percentagewise. If the underlying stock rises in price, some amount of time value premium will come back into the various puts, and the longest-term put will have the largest amount of time premium. For example, if the stock rises back to 50, the following prices might exist:

XYZ common, 50;
XYZ April 50 put, 1;
XYZ July 50 put, 2.50; and
XYZ October 50 put, 3.50.

The purchase of the longer-term October 50 put would have suffered the least loss, percentagewise, in this event. Consequently, when one is purchasing an in-the-money put, he may often want to consider buying the longest-term put if the time value premium is small when compared to the time premium in the nearer-term puts.

In Chapter 3, the delta of an option was described as the amount by which one might expect the option will increase or decrease in price if the underlying stock moves by a fixed amount (generally considered to be one point, for simplicity). Thus, if XYZ is at 49 and a call option is priced at 3 with a delta of .50, one would expect the call to sell for 3.50 with XYZ at 50 and to sell at 2.50 with XYZ at 48. In reality, the delta changes even on a fractional move in the underlying stock, but one generally assumes that it will hold true for a 1-point move. Obviously, put options have deltas as well. The delta of a put is a negative number, reflecting the fact that the put price and the stock price are inversely related. *As an approximation, one could say that the delta of the call option minus the delta of the put option with the same terms is equal to 1.* That is,

$$\text{Delta of put} = \text{Delta of call} - 1.$$

This is an approximation and is accurate unless the put is deeply in-the-money. It has already been pointed out that the time value premium behavior of puts and calls is different, so it is inaccurate to assume that this formula holds true exactly for all cases.

The delta of a put ranges between 0 and minus 1. If a July 50 put has a delta of –.50, and the underlying stock *rises* by 1 point, the put will lose .50. The delta of a deeply out-of-the-money put is close to zero. The put's delta would decrease slowly at first as the stock declined in value, then would begin to decrease much more rapidly as the stock fell through the striking price, and would reach a value of minus 1 (the minimum) as the stock fell only moderately below the striking price. This is reflective of the fact that an out-of-the-money put tends to hold time premium quite well and an in-the-money put comes to parity rather quickly.

RANKING PROSPECTIVE PUT PURCHASES

In Chapter 3, a method of ranking prospective call purchases was developed that encompassed certain factors, such as the volatility of the underlying stock and the expected holding period of the purchased option. The same sort of analysis should be applied to put option purchases.

The steps are summarized below. The reader may refer to the section titled "Advanced Selection Criteria" in Chapter 3 for a more detailed description of why this method of ranking is superior.

1. Assume that each underlying stock can decrease in price in accordance with its volatility over a fixed holding period (30, 60, or 90 days).
2. Estimate the put option prices after the decrease.
3. Rank all potential put purchases by the highest reward opportunity for aggressive purchases.
4. Estimate how much would be lost if the underlying stock instead rose in accordance with its volatility, and rank all potential put purchases by best risk/reward ratio for a more conservative list of put purchases.

As was stated earlier, it is necessary to have a computer to make an accurate analysis of all listed options. The average customer is forced to obtain such data from a brokerage firm or data service. He should be sure that the list he is using conforms to the above-mentioned criteria. If the data service is ranking option purchases by how well the puts would do if each underlying stock fell by a fixed percentage (such as 5% or 10%), the list should be rejected because it is not incorporating the volatility of the underlying stock into its analysis. Also, if the list is based on holding the put purchase until expiration, the

list should be rejected as well, because this is not a realistic assumption. There are enough reliable and sophisticated data services that one should not have to work with inferior analyses in today's option market.

For those readers who are more mathematically advanced and have the computer capability to construct their own analyses, the details of implementing an analysis similar to the one described above are presented in Chapter 28, Mathematical Applications. An application of put purchases, combined with fixed-income securities, is described in Chapter 26, Buying Options and Treasury Bills.

FOLLOW-UP ACTION

The put buyer can take advantage of strategies that are very similar to those the call buyer uses for follow-up action, either to lock in profits or to attempt to improve a losing situation. Before discussing these specific strategies, it should be stated again that it is rarely to the option buyer's benefit to exercise the option in order to liquidate. This precludes, of course, those situations in which the call buyer actually wants to own the stock or the put buyer actually wants to sell the stock. If, however, the option holder is merely looking to liquidate his position, the cost of stock commissions makes exercising a prohibitive move. This is true even if he has to accept a price that is a slight discount from parity when he sells his option.

LOCKING IN PROFITS

The reader may recall that there were four strategies (perhaps "tactics" is a better word) for the call buyer with an unrealized profit. These same four tactics can be used with only slight variations by the put option buyer. Additionally, a fifth strategy can be employed when a stock has both listed puts and calls.

After an underlying stock has moved down and the put buyer has a relatively substantial unrealized gain, he might consider taking one of the following actions:

1. Sell the put and liquidate the position for a profit.
2. Do nothing and continue to hold the put.
3. Sell the in-the-money long put and use part of the proceeds to purchase out-of-the-money puts.
4. Create a spread by selling an out-of-the-money put against the one he currently holds.

These are the same four tactics that were discussed earlier with respect to call buying. In the fifth tactic, the holder of a listed put who has an unrealized profit might consider buying a listed *call* to protect his position.

TABLE 16-3.
Background table for profit alternatives.

Original Trade	Current Prices	
XYZ common: 52	XYZ common:	45
Bought XYZ October 50 put at 2	XYZ October 50 put:	6
	XYZ October 45 put:	2

Example: A speculator originally purchased an XYZ October 50 put for 2 points when the stock was 52. If the stock has now fallen to 45, the put might be worth 6 points, representing an unrealized gain of 4 points and placing the put buyer in a position to implement one of these five tactics. After some time has passed, with the stock at 45, an at-the-money October 45 put might be selling for 2 points. Table 16-3 summarizes the situation. If the trader merely liquidates his position by selling out the October 50 put, he would realize a profit of 4 points. Since he is terminating the position, he can make neither more nor less than 4 points. This is the most conservative of the tactics, allowing no additional room for appreciation, but also eliminating any chance of losing the accumulated profits.

If the trader does nothing, merely continuing to hold the October 50 put, he is taking an aggressive action. If the stock should reverse and rise back above 50 by expiration, he would lose everything. However, if the stock continues to fall, he could build up substantially larger profits. This is the only tactic that could eventually result in a loss at expiration.

These two simple strategies—liquidating or doing nothing—are the easiest alternatives. The remaining strategies allow one to attempt to achieve a balance between retaining built-up profits and generating even more profits. The third tactic that the speculator could use would be to sell the put that he is currently holding and use some of the proceeds to purchase the October 45 put. *The general idea in this tactic is to pull one's initial investment out of the market* and then to increase the number of option contracts held by buying the out-of-the-money option.

Example: The trader would receive 6 points from the sale of the October 50 put. He should take 2 points of this amount and put it back into his pocket, thus covering his initial investment. Then he could buy 2 October 45 puts at 2 points each with the remaining portion of the proceeds from the sale. He has no risk at expiration with this strategy, since he has recovered his initial investment. Moreover, if the underlying stock should continue to fall rapidly, he could profit handsomely because he has increased the number of put contracts that he holds.

The fourth choice that the put holder has is to create a spread by selling the October 45 put against the October 50 that he currently holds. This would create a bear spread,

technically. This type of spread is described in more detail later. For the time being, it is sufficient to understand what happens to the trader's risks and rewards by creating this spread. The sale of the October 45 put brings in 2 points, which covers the initial 2-point purchase cost of the October 50 put. Thus, *his "cost" for this spread is nothing;* he has no risk, except for commissions. If the underlying stock should rise above 50 by expiration, all the puts would expire worthless. (A put expires worthless when the underlying stock is above the striking price at expiration.) This would represent the worst case; he would recover nothing from the spread. If the stock should be below 45 at expiration, he would realize the maximum potential of the spread, which is 5 points. That is, no matter how far XYZ is below 45 at expiration, the October 50 put will be worth 5 points more than the October 45 put, and the spread could thus be liquidated for 5 points. His maximum profit potential in the spread situation is 5 points. This tactic would be the best one if the underlying stock stabilized near 45 until expiration.

To analyze the fifth strategy that the put holder could use, it is necessary to introduce a call option into the picture.

Example: With XYZ at 45, there is an October 45 call selling for 3 points. The put holder could buy this call in order to limit his risk and still retain the potential for large future profits. If the trader buys the call, he will have the following position:

Long 1 October 50 put
Long 1 October 45 call – Combined cost: 5 points

The total combined cost of this put and call combination is 5 points—2 points were originally paid for the put, and now 3 points have been paid for the call. No matter where the underlying stock is at expiration, this combination will be worth at least 5 points. For example, if XYZ is at 46 at expiration, the put will be worth 4 and the call worth 1; or if XYZ is at 48, the put will be worth 2 and the call worth 3. If the stock is above 50 or below 45 at expiration, the combination will be worth more than 5 points. Thus, the trader has no risk in this combination, since he has paid 5 points for it and will be able to sell it for at least 5 points at expiration. In fact, if the underlying stock continues to drop, the put will become more valuable and he could build up substantial profits. Moreover, if the underlying stock should reverse direction and climb substantially, he could still profit, because the call will then become valuable. This tactic is the best one to use if the underlying stock does not stabilize near 45, but instead makes a relatively dramatic move either up or down by expiration. The strategy of simultaneously owning both a put and a call is discussed in much greater detail in Chapter 23. It is introduced here merely for the purposes of the put buyer wanting to obtain protection of his unrealized profits.

Each of these five strategies may work out to be the best one under a different set of circumstances. The ultimate result of each tactic is dependent on the direction that XYZ moves in the future. As was the case with call options, *the spread tactic never turns out to be the worst tactic*, although it is the best one only if the underlying stock stabilizes. Tables 16-4 and 16-5 summarize the results the speculator could expect from invoking each of these five tactics. The tactics are:

1. Liquidate—sell the long put for a profit and do not reinvest.
2. Do nothing—continue to hold the long put.

TABLE 16-4.
Comparison of the five tactics.

By expiration, if XYZ . . .	the best strategy was . . .	and the worst strategy was . . .
Continues to fall dramatically	"Roll down"	Liquidate
Falls moderately further	Do nothing	Combine
Remains relatively unchanged	Spread	Combine or "roll down"
Rises moderately	Liquidate	"Roll down" or do nothing
Rises substantially	Combine	Do nothing

TABLE 16-5.
Results of adopting each of the five tactics.

XYZ Price at Expiration	"Roll Down" Profit	Do-Nothing Profit	Spread Profit	Liquidate Profit	Combine Profit
30	+ $3,000 (B)	+$1,800	+ $500	+$400 (W)	+ $1,500
35	+ 2,000 (B)	+ 1,300	+ 500	+ 400 (W)	+ 1,000
41	+ 800 (B)	+ 700	+ 500	+ 400 (W)	+ 400
42	+ 600 (B)	+ 600 (B)	+ 500	+ 400	+ 300 (W)
43	+ 400	+ 500 (B)	+ 500 (B)	+ 400	+ 200 (W)
45	0 (W)	+ 300	+ 500 (B)	+ 400	0 (W)
46	0 (W)	+ 200	+ 400 (B)	+ 400 (B)	0 (W)
48	0 (W)	0 (W)	+ 200	+ 400 (B)	0 (W)
50	0	– 200 (W)	0	+ 400 (B)	0
54	0	– 200 (W)	0	+ 400 (B)	+ 400 (B)
60	0	– 200 (W)	0	+ 400	+ 1,000 (B)

3. "Roll down"—sell the long put, pocket the initial investment, and invest the remaining proceeds in out-of-the-money puts at a lower strike.
4. "Spread"—create a spread by selling the out-of-the-money put against the put already held.
5. "Combine"—create a combination by buying a call at a lower strike while continuing to hold the put.

Note that each tactic is the best one under one of the scenarios, but that the spread tactic is never the worst of the five. The actual results of each tactic, using the figures from the example above, are depicted in Table 16-5, where B denotes best tactic and W denotes worst one.

All the strategies are profitable if the underlying stock continues to fall dramatically, although the "roll down," "do nothing," and combinations work out best, because they continue to accrue profits if the stock continues to fall. Every time one takes partial profits, rolls down, or takes other measures, he is doing something bullish to his position. Those little bullish actions will be harmful if the underlying continues to decline. Rather, a trailing stop, placed *above* the declining stock price, might be the best tactic of all, because it allows one's profits to run. If the underlying stock rises instead, only the combination outdistances the simplest tactic of all, liquidation.

If the underlying stock stabilizes, the "do-nothing" and "spread" tactics work out best. It would generally appear that the combination tactic or the "roll-down" tactic would be the most attractive, since neither one has any risk and both could generate large profits if the stock moved substantially. The advantage for the spread was substantial in call options, but in the case of puts, the premium received for the out-of-the-money put is not as large, and therefore the spread strategy loses some of its attractiveness. Finally, any of these tactics could be applied partially; for example, one could sell out half of a profitable long position in order to take some profits, and continue to hold the remainder.

LOSS-LIMITING ACTIONS

The foregoing discussion concentrated on how the put holder could retain or increase his profit. However, it is often the case in option buying that the holder of the option is faced with an unrealized loss. The put holder may also have several choices of action to take in this case. His first, and simplest, course of action would be to sell the put and take his loss. Although this is advisable in certain cases, especially when the underlying stock seems to have assumed a distinctly bullish stance, it is not always the wisest thing to do. The put holder who has a loss may also consider either "rolling up" to create a bearish spread or

entering into a calendar spread. Either of these actions could help him recover part or all of his loss.

THE "ROLLING-UP" STRATEGY

The reader may recall that a similar action to "rolling up," termed "rolling down," was available for call options held at a loss and was described in Chapter 3. The put buyer who owns a put at a loss may be able to create a spread that allows him to break even at a more favorable price at expiration. Such action will inevitably limit his profit potential, but is generally useful in recovering something from a put that might otherwise expire totally worthless.

Example: An investor initially purchases an XYZ October 45 put for 3 points when the underlying stock is at 45. However, the stock rises to 48 at a later date and the put that was originally bought for 3 points is now selling for 1.50 points. It is not unusual, by the way, for a put to retain this much of its value even though the stock has moved up and some amount of time has passed, since out-of-the-money puts tend to hold time value premium rather well. With XYZ at 48, an October 50 put might be selling for 3 points. The put holder could create a position designed to permit recovery of some of his losses by *selling two of the puts that he is long—October 45's—and simultaneously buying one October 50 put.* The net cost for this transaction would be only commissions, since he receives $300 from selling two puts at 1.50 each, which completely covers the $300 cost of buying the October 50 put. The transactions are summarized in Table 16-6.

By selling 2 of the October 45 puts, the investor is now short an October 45 put. Since he also purchased an October 50 put, he has a spread (technically, a bear spread). He has spent no additional money, except commissions, to set up this spread, since the sale of the October 45's covered the purchase of the October 50 put. *This strategy is most attractive when the debit involved to create the spread is small.* In this example, the debit is zero.

The effect of creating this spread is that *the investor has not increased his risk at all, but has raised the break-even point for his position.* That is, if XYZ merely falls a small distance, he will be able to get out even. Without the effect of creating the spread, the put holder would need XYZ to fall back to 42 at expiration in order for him to break even, since he originally paid 3 points for the October 45 put. His original risk was $300. If XYZ continues to rise in price and the puts in the spread expire worthless, the net loss will still be only $300 plus additional commissions. Admittedly, the commissions for the spread will increase the loss slightly, but they are small in comparison to the debit of the position ($300). On the other hand, if the stock should fall back only slightly, to 47 by expiration,

TABLE 16-6.
Summary of rolling-up transactions.

Original trade:	Buy 1 October 45 put for 3 with XYZ at 45	$300 debit
Later:	With XYZ at 48, sell 2 October 45's for 1.50 each	$300 credit
	and buy 1 October 50 put for 3	$300 debit
Net position:	Long 1 October 50 put Short 1 October 45 put	$300 debit

the spread will break even. At expiration, with XYZ at 47, the in-the-money October 50 put will be worth 3 points and the out-of-the-money October 45 put will expire worthless. Thus, the investor will recover his $300 cost, except for commissions, with XYZ at 47 at expiration. His break-even point is raised from 42 to 47, a substantial improvement of his chances for recovery.

The implementation of this spread strategy reduces the profit potential of the position, however. The maximum potential of the spread is 2 points. If XYZ is anywhere below 45 at expiration, the spread will be worth 5 points, since the October 50 put will sell for 5 points more than the October 45 put. The investor has limited his potential profit to 2 points—the 5-point maximum width of the spread, less the 3 points that he paid to get into the position. He can no longer gain substantially on a large drop in price by the underlying stock. This is normally of little concern to the put holder faced with an unrealized loss and the potential for a total loss. He generally would be appreciative of getting out even or of making a small profit. The creation of the spread accomplishes this objective for him.

It should also be pointed out that he does not incur the maximum loss of his entire debit plus commissions, unless XYZ closes above 50 at expiration. If XYZ is anywhere below 50, the October 50 will have some value and the investor will be able to recover something from the position. This is distinctly different from the original put holding of the October 45, whereby the maximum loss would be incurred unless the stock were below 45 at expiration. *Thus, the introduction of the spread also reduces the chances of having to realize the maximum loss.*

In summary, the put holder faced with an unrealized loss may be able to create a spread by selling twice the number of puts that he is currently long and simultaneously buying the put at the next higher strike. This action should be used only if the spread can be transacted at a small debit or, preferably, at even money (zero debit). The spread

position offers a much better chance of breaking even and also reduces the possibility of having to realize the maximum loss in the position. However, the introduction of these loss-limiting measures reduces the maximum potential of the position if the underlying stock should subsequently decline in price by a significant amount. Using this spread strategy for puts would require a margin account, just as calls do.

THE CALENDAR SPREAD STRATEGY

Another strategy is sometimes available to the put holder who has an unrealized loss. If the put that he is holding has an intermediate-term or long-term expiration date, he might be able to create a *calendar spread* by selling the near-term put against the put that he currently holds.

Example: An investor bought an XYZ October 45 put for 3 points when the stock was at 45. The stock rises to 48, moving in the wrong direction for the put buyer, and his put falls in value to 1.50. He might, at that time, consider selling the near-term July 45 put for 1 point. The ideal situation would be for the July 45 put to expire worthless, reducing the cost of his long put by 1 point. Then, if the underlying stock declined below 45, he could profit after July expiration.

The major drawback to this strategy is that little or no profit will be made—in fact, a loss is quite possible—if the underlying stock falls back to 45 or below before the near-term July option expires. Puts display different qualities in their time value premiums than calls do, as has been noted before. With the stock at 45, the differential between the July 45 put and the October 45 put might not widen much at all. This would mean that the spread has not gained anything, and the spreader has a loss equal to his commissions plus the initial unrealized loss. In the example above, if XYZ dropped quickly back to 45, the July 45 might be worth 1.50 and the October worth 2.50. At this point, the spreader would have a loss on both sides of his spread: He sold the July 45 put for 1 and it is now 1.50; he bought the October 45 for 3 and it is now 2.50; plus he has spent two commissions to date and would have to spend two more to liquidate the position.

At this point, the strategist may decide to do nothing and take his chances that the stock will subsequently rally so that the July 45 put will expire worthless. However, if the stock continues to decline below 45, the spread will most certainly become more of a loss as both puts come closer to parity.

This type of spread strategy is not as attractive as the "rolling-up" strategy. In the "rolling-up" strategy, one is not subjected to a loss if the stock declines after the spread is established, although he does limit his profits. The fact that the calendar spread strategy can lead to a loss even if the stock declines makes it a less desirable alternative.

EQUIVALENT POSITIONS

Before considering other put-oriented strategies, the reader should understand the definition of an equivalent position. Two strategies, or positions, are equivalent when they have the same profit potential. They may have different collateral or investment requirements, but they have similar profit potentials. Many of the call-oriented strategies that were discussed in Part II of the book have an equivalent put strategy. One such case has already been described: The "protected short sale," or shorting the common stock and buying a call, is equivalent to the purchase of a put. That is, both have a limited risk above the striking price of the option and relatively large profit potential to the downside. *An easy way to tell if two strategies are equivalent is to see if their profit graphs have the same shape.* The put purchase and the "protected short sale" have profit graphs with exactly the same shape (Figures 16-1 and 4-1, respectively). As more put strategies are discussed, it will always be mentioned if the put strategy is equivalent to a previously described call strategy. This may help to clarify the put strategies, which understandably may seem complex to the reader who is not familiar with put options.

CHAPTER 17

Put Buying in Conjunction with Common Stock Ownership

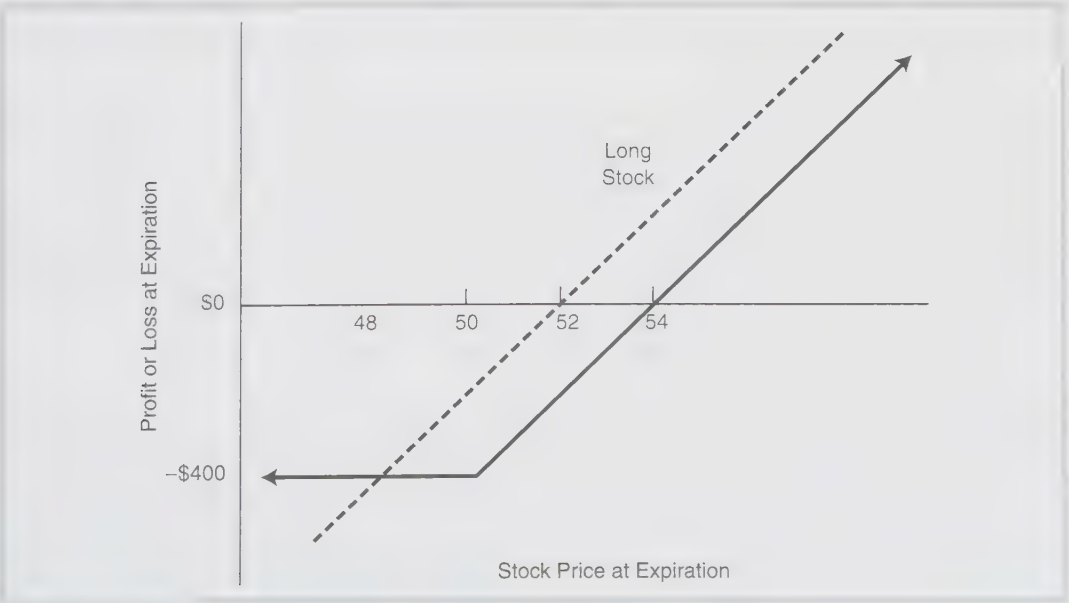
Another useful feature of put options, in addition to their speculative leverage in a downward move by the underlying stock, is that *the put purchase can be used to limit downside loss in a stock that is owned.* When one simultaneously owns both the common stock and a put on that same stock, he has a position with limited downside risk during the life of the put. This position is also called a synthetic long call, because the profit graph is the same shape as a long call's.

Example: An investor owns XYZ stock, which is at 52, and purchases an XYZ October 50 put for 2. The put gives him the right to *sell* XYZ at 50, so the most that the stockholder can lose on his stock is 2 points. Since he pays 2 points for the put protection, his maximum potential loss until October expiration is 4 points, no matter how far XYZ might decline up until that time. If, on the other hand, the price of the stock should move up by October, the investor would realize any gain in the stock, less the 2 points that he paid for the put protection. *The put functions much like an insurance policy with a finite life.* Table 17-1 and Figure 17-1 depict the results at October expiration for this position: buying the October 50 put for 2 points to protect a holding in XYZ common stock, which is selling at 52. The dashed line on the graph represents the profit potential of the common stock ownership by itself. Notice that if the stock were below 48 in October, the common stock owner would have been better off buying the put. However, with XYZ above 48 at expiration, the put purchase was a burden that cost a small portion of potential profits.

TABLE 17-1.
Results at expiration on a protected stock holding.

XYZ Price at Expiration	Stock Profit	Put Profit	Total Profit
30	$2,200	+ $1,800	– $ 400
40	– 1,200	+ 800	– 400
50	– 200	– 200	– 400
54	+ 200	– 200	0
60	+ 800	– 200	+ 600
70	+ 1,800	– 200	+ 1,600
80	+ 2,800	– 200	+ 2,600

FIGURE 17-1.
Long common stock and long put.



This strategy, however, is not necessarily geared to maximizing one's profit potential on the common stock, but rather provides the stock owner with *protection*, eliminating the possibility of any devastating loss on the stock holding during the life of the put. In all the put buying strategies discussed in this chapter and Chapter 18, the put must be paid for in full. That is the only increase in investment.

Although any common stockholder may use this strategy, two general classes of stock owners find it particularly attractive: First, the long-term holder of the stock who is not considering selling the stock may utilize the put protection to limit losses over a short-term horizon. Second, the buyer of common stock who wants some "insurance" in case he is wrong may also find the put protection attractive.

The long-term holder who strongly feels that his stock will drop should probably sell that stock. However, his cost basis may make the capital gains tax on the sale prohibitive. He also may not be entirely sure that the stock will decline—and may want to continue to hold the stock in case it *does* go up. In either case, the purchase of a put will limit the stockholder's downside risk while still allowing room for upside appreciation. A large number of individual and institutional investors have holdings that they might find difficult to sell for one reason or another. The purchase of a low-cost put can often reduce the negative effects of a bear market on their holdings.

The second general class of put buyers for protection includes the investor who is *establishing* a position in the stock. He might want to buy a put at the same time that he buys the stock, thereby creating a position with profitability as depicted in the previous profit graph. He immediately starts out with a position that has limited downside risk with large potential profits if the stock moves up. In this way, he can feel free to hold the stock during the life of the put without worrying about when to sell it if it should experience a temporary setback. Some fairly aggressive stock traders use this technique because it eliminates the necessity of having to place a stop loss order on the stock. It is often frustrating to see a stock fall and touch off one's stop loss limit order, only to subsequently rise in price. The stock owner who has a put for protection need not overreact to a downward move. He can afford to sit back and wait during the life of the put, since he has built-in protection.

WHICH PUT TO BUY

The selection of which put the stock owner purchases will determine how much of his profit potential he is giving up and how much risk he is limiting. An out-of-the-money put will cost very little. Therefore, it will be less of a hindrance on profit potential if the underlying stock rises in price. Unfortunately, the put's protective feature is small until the stock falls to the striking price of the put. Therefore, *the purchase of the out-of-the-money put will not provide as much downside protection as an at- or in-the-money put would.* The purchase of a deeply out-of-the-money put as protection is more like "disaster insurance": It will prevent a stock owner from experiencing a disaster in terms of a downside loss during the life of the put, but will not provide much protection in the case of a limited stock decline.

Example: XYZ is at 40 and the October 35 put is selling for .50. The purchase of this put as protection for the common stock would not reduce upside potential much at all, only by .50. However, the stock owner could lose 5.50 points if XYZ fell to 35 or below. That is his maximum possible loss, for if XYZ were below 35 at October expiration, he could exercise his put to sell the stock at 35, losing 5 points on the stock, and he would have paid 50 cents for the put, bringing his total loss to 5.50 points.

At the opposite end of the spectrum, the stock owner might buy an in-the-money put as protection. This would quite severely limit his profit potential, since the underlying stock would have to rise above the strike and more for him to make a profit. However, the in-the-money put provides vast quantities of downside protection, limiting his loss to a very small amount.

Example: XYZ is again at 40 and there is an October 45 put selling for 5.50. The stock owner who purchases the October 45 put would have a maximum risk of 50 cents, for he could always exercise the put to sell stock at 45, giving him a 5-point *gain* on the stock, but he paid 5.50 points for the put, thereby giving him an overall maximum loss of 50 cents. He would have difficulty making any profit during the life of the put, however. XYZ would have to rise by more than 5.50 points (the cost of the put) for him to make any total profit on the position by October expiration.

The deep in-the-money put purchase is overly conservative and is usually not a good strategy. On the other hand, it is not wise to purchase a put that is too deeply out-of-the-money as protection. *Generally, one should purchase a slightly out-of-the-money put as protection.* This helps to achieve a balance between the positive feature of protection for the common stock and the negative feature of limiting profits.

The reader may find it interesting to know that he has actually gone through this analysis, back in Chapter 3. Glance again at the profit graph for this strategy of using the put purchase to protect a common stock holding (Figure 17-1). It has exactly the same shape as the profit graph of a simple call purchase. *Therefore, the call purchase and the long put/long stock strategies are equivalent.* Again, by equivalent it is meant that they have similar profit potentials. Obviously, the ownership of a call differs substantially from the ownership of common stock and a put. The stock owner continues to maintain his position for an indefinite period of time, while the call holder does not. Also, the stockholder is forced to pay substantially more for his position than is the call holder, and he also receives dividends whereas the call holder does not. Therefore, "equivalent" does not mean *exactly* the same when comparing call-oriented and put-oriented strategies, but rather denotes that they have similar profit potentials.

In Chapter 3, it was determined that the slightly in-the-money call often offers the best ratio between risk and reward. When the call is slightly in-the-money, the stock is

above the striking price. Similarly, the slightly out-of-the-money put often offers the best ratio between risk and reward for the common stockholder who is buying the put for protection. Again, the stock is slightly above the striking price. Actually, since the two positions are equivalent, the same conclusions should be arrived at; that is why it was stated that the reader has been through this analysis previously.

TAX CONSIDERATIONS

Although tax considerations are covered in detail in a later chapter, an important tax law concerning the purchase of puts against a common stock holding should be mentioned at this time. If the stock owner is already a long-term holder of the stock at the time that he buys the put, the put purchase has no effect on his tax status. Similarly, if the stock buyer buys the stock at the time that he buys the put and identifies the position as a hedge, there is no effect on the tax status of his stock. However, *if one is currently a short-term holder of the common stock at the time that he buys a put, he eliminates any accrued holding period on his common stock. Moreover, the holding period for that stock does not begin again until the put is sold.*

Example: Assume the long-term holding period is 6 months. That is, a stock owner must own the stock for 6 months before it can be considered a long-term capital gain. An investor who bought the stock and held it for 5 months and then purchased a put would wipe out his entire holding period of 5 months. Suppose he then held the put and the stock simultaneously for 6 months, liquidating the put at the end of 6 months. His holding period would start all over again for that common stock. Even though he has owned the stock for 11 months—5 months prior to the put purchase and 6 months more while he simultaneously owned the put—his holding period for tax purposes is considered to be zero!

This law could have important tax ramifications, and one should consult a tax advisor if he is in doubt as to the effect that a put purchase might have on the taxability of his common stock holdings.

PUT BUYING AS PROTECTION FOR THE COVERED CALL WRITER

Since put purchases afford protection to the owner of common stock, some investors naturally feel that the same protective feature could be used to limit their downside risk in the covered call writing strategy. Recall that the covered call writing strategy involves the purchase of stock and the sale of a call option against that stock. The covered write has limited upside profit potential and offers protection to the downside in the amount of

the call premium. The covered writer will make money if the stock falls a little, remains unchanged, or rises by expiration. The covered writer can actually lose money only if the stock falls by more than the call premium received. He has potentially large downside losses. This strategy is known as a *protective collar* or, more simply, a "collar." (It is also called a "hedge wrapper," although that is an outdated term.)

The purchase of an out-of-the-money put option can eliminate the risk of large potential losses for the covered write, although the money spent for the put purchase will reduce the overall return from the covered write. One must therefore include the put cost in his initial calculations to determine if it is worthwhile to buy the put.

Example: XYZ is at 39 and there is an XYZ October 40 call selling for 3 points and an XYZ October 35 put selling for .50. A covered write could be established by buying the common at 39 and selling the October 40 call for 3. This covered write would have a maximum profit potential of 4 points if XYZ were anywhere above 40 at expiration. The write would lose money if XYZ were anywhere below 36, the break-even point, at October expiration. By also purchasing the October 35 put at the time the covered write is initiated, the covered writer will limit his profit potential slightly, but will also greatly reduce his risk potential. If the put purchase is added to the covered write, the maximum profit potential is reduced to 3.50 points at October expiration. The break-even point moves up to 36.50, and the writer will experience some loss if XYZ is below 36.50 at expiration. However, the most that the writer could lose would be 1.50 points if XYZ were below 35 at expiration. The purchase of the put option produces this loss-limiting effect. Table 17-2 and Figure 17-2 depict the profitability of both the regular covered write and the covered write that is protected by the put purchase.

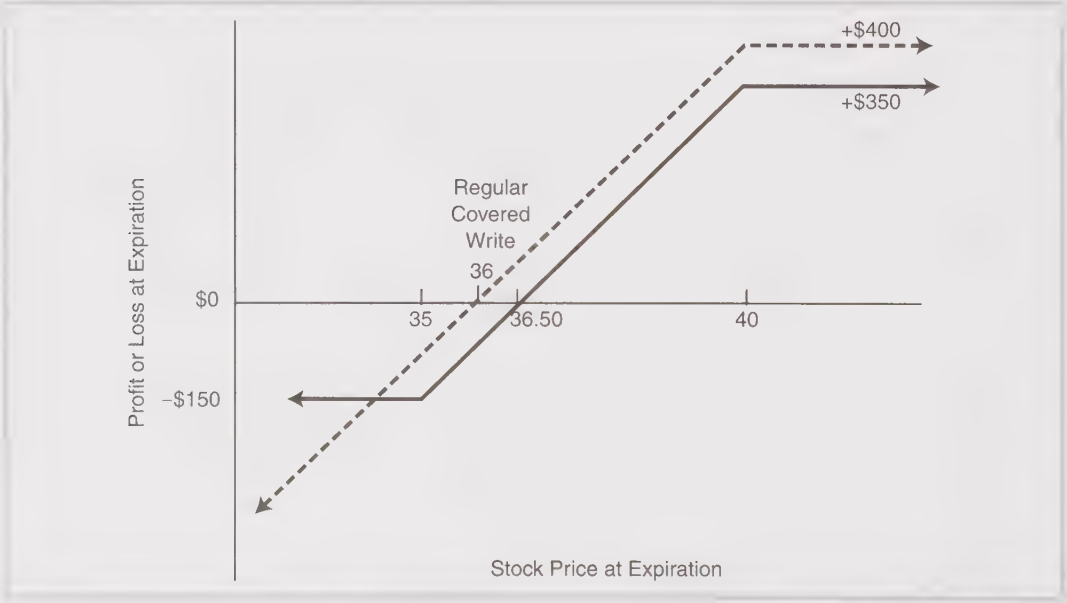
Commissions should be carefully included in the covered writer's return calculations, as well as the cost of the put. It was demonstrated in Chapter 2 that the covered writer must include all commissions and margin interest expenses as well as all dividends received in order to produce an accurate "total return" picture of the covered write. Figure 17-2 shows that the break-even point is raised slightly and the overall profit potential is reduced by the purchase of the put. However, *the maximum risk is quite small and the writer need never be forced to roll down in a disadvantageous situation.*

Recall that the covered writer who does not have the protective put in place is forced to roll down in order to gain increased downside protection. Rolling down merely means that he buys back the call that is currently written and writes another call, with a lower striking price, in its place. This rolling-down action can be helpful if the stock stabilizes after falling; but if the stock reverses and climbs upward in price again, the covered writer who rolled down would have limited his gains. In fact, he may even have "locked in" a loss. The writer who has the protective put need not be bothered with such things. He never has to roll down, for he has a limited maximum loss. Therefore, he should never get into

TABLE 17-2.
Comparison of regular and protected covered writes.

XYZ Price at Expiration	Stock Profit	October 40 Call Profit	October 35 Put Profit	Total Profit
25	–$1,400	+$300	+$950	–$150
30	– 900	+ 300	+ 450	– 150
35	– 400	+ 300	– 50	– 150
36.50	– 250	+ 300	– 50	0
38	– 100	+ 300	– 50	+ 150
40	+ 100	+ 300	– 50	+ 350
45	+ 600	– 200	– 50	+ 350
50	+ 1,100	– 700	– 50	+ 350

FIGURE 17-2.
Covered call write protected by a put purchase.



a "locked-in" loss situation. This can be a great advantage, especially from an emotional viewpoint, because the writer is never forced to make a decision as to the future price of the stock in the middle of the stock's decline. With the put in place, he can feel free to take no action at all, since his overall loss is limited. If the stock should rally upward later, he will still be in a position to make his maximum profit.

The longer-term effects of buying puts in combination with covered writes are not easily definable, but it would appear that the writer reduces his overall rate of return slightly by buying the puts. This is because he gives something away if the stock falls slightly, remains unchanged, or rises in price. He only "gains" something if the stock falls heavily. Since the odds of a stock falling heavily are small in comparison to the other events (falling slightly, remaining unchanged, or rising), the writer will be gaining something in only a small percentage of cases. However, the put buying strategy may still prove useful in that it removes the emotional uncertainty of large losses. The covered writer who buys puts may often find it easier to operate in a more rational manner when he has the protective put in place.

This strategy is equivalent to one that has been described before, the bull spread. Notice that the profit graph in Figure 17-2 has the same shape as the bull spread profit graph (Figure 7-1). This means that the two strategies are equivalent. In fact, in Chapter 7 it was pointed out that the bull spread could sometimes be considered a "substitute" for covered writing. Actually, the bull spread is more akin to this strategy—the covered write protected by a put purchase. There are, of course, differences between the strategies. They are equivalent in profit and loss potential, but the covered writer could never lose all his investment in a short period of time, although the spreader could. In order to actually use bull spreads as substitutes for covered writes, one would invest only a small portion of his available funds in the spread and would place the remainder of his funds in fixed-income securities. That strategy was discussed in more depth in Chapter 7.

NO-COST COLLARS

The "collar" strategy is often arrived at in another manner: a stockholder begins to worry about the downside potential of the stock market and decides to buy puts on his stock as protection. However, he is dismayed by the cost of the puts and so he *also* considers the sale of calls. If he buys an out-of-the-money put, it is quite possible that he might be able to sell an out-of-the-money call whose proceeds completely cover the cost of the put. Thus, he has established a protective *collar* at no cost—at least no debit. His "cost" is the fact that he has forsaken the upside profit potential on his stock, above the striking price of the written call.

In fact, certain large institutional traders are able to transact collars through large over-the-counter option brokers, such as Goldman Sachs or Morgan Stanley. They might even give the broker instructions such as this: "I own XYZ and I want to buy a put 10 percent out of the money that expires in a year. What would the striking price of a one-year call have to be in order to create a no-cost collar?" The broker might then tell him that such a call would have to be struck 30 percent out of the money. The actual strike

TABLE 17-3.
Highest Call Strike That Pays for an At-the-Money Put (Assuming 2.5 years to expiration)

Volatility	Call Strike of Underlying
30%	30% out of money
40%	35% out of money
50%	40% out of money
70%	50% out of money
100%	70% out of money

price of the call would depend on the volatility estimate for the underlying stock, as well as interest rates and dividends. These types of transactions occur with a fair amount of frequency.

Some very interesting situations can be created with long-term options. One of the most interesting occurred in 1999, when a company that owned 5 million shares of Cisco (CSCO) decided it would like to hedge them by creating a no-cost collar over the next three years. At the time, CSCO was trading at about 130, and its volatility was about 50%. It turns out that a three-year put struck at 130 sells for about the same price as a three-year call struck at 200! That may seem illogical, but the figures can be checked out with the aid of an option-pricing model. Thus, this company was able to hedge all of its CSCO stock, with no downside risk (the striking price of the puts was the same as the current stock price) and still had profit potential of over 50% to the upside over the next three years.

Thus, one should consider using LEAPS options when he establishes a collar—even if he is not an institutional trader—because the striking price of the calls can be quite high in comparison to that of the put's strike or in comparison to the price of the underlying stock. Table 17-3 shows how far out-of-the-money a written call could be that still covers the cost of buying an at-the-money put. The time to expiration in this table is 2.5 years—the longest term listed option that currently exists.

USING LOWER STRIKES AS A PARTIAL COVERED WRITE

It should also be pointed out that one does not necessarily have to forsake all of the profit potential from his stock. He might buy the puts, as usual, and then sell calls with a somewhat lower strike than needed for a low-cost collar, but the quantity of calls sold would be less than that of stock owned. In that way, there would be unlimited profit potential on *some* of the shares of the underlying stock.

Example: Suppose that the following prices exist:

XYZ: 61
Apr 55 put: 1
Apr 65 call: 2

Furthermore, suppose that one owns 1000 shares of XYZ. Thus, the purchase of 10 Apr 55 puts at 1 point apiece would protect the downside. In order to cover the cost of those puts ($1000), one need only sell *five* of the Apr 65 calls at 2 points apiece. Thus, the protection would have cost nothing and there would still be unlimited profit potential on 500 of the shares of XYZ, since only five calls were sold against the 1000 shares that are owned.

In this manner, one could get quite creative in constructing collars—deciding what call strike to use in order to strike a balance between paying for the puts and allowing upside profit potential. The lower the strike he uses for the written calls, the fewer calls he will have to write; the higher the strike of the written calls, the more calls will be necessary to cover the cost of the purchased puts. The tradeoff is that a lower call strike allows for more eventual upside profit potential, but it limits what has been written against to a lower price.

Using the above example once again, these facts can be demonstrated:

Example (continued): As before, the same prices exist, but now one more call will be brought into the picture:

XYZ: 61
Apr 55 put: 1
Apr 65 call: 2
Apr 70 call: 1

As before one could sell *five* of the Apr 65 calls to cover the cost of ten puts, or as an alternative he could sell *ten* of the Apr 70 calls. If he sells the five, he has unlimited profit potential on 500 shares, but the other 500 shares will be called away at 65. In the alternative strategy, he has limited upside profit potential, but nothing will be called away until the stock reaches 70. Which is "better?" It's not easy to say. In the former strategy, if the stock climbs all the way to 75, it results in the same profit as if the stock is called away at 70 in the latter strategy. This is true because 500 shares would be worth 75, but the other 500 would have been called away at 65—making for an average of 70. Hence, the former strategy only outperforms the latter if the stock actually climbs *above* 75—a rather unlikely event, one

would have to surmise. Still, many investors prefer the former strategy because it gives them protection without asking them to surrender all of their upside profit potential.

ADJUSTING THE COLLAR

A collar might be adjusted if the underlying stock declines sharply in price. After the stock has dropped, the put would be worth a considerable amount, while the call would be worth very little. If the investor felt that the majority of the decline in the stock was finished, he could merely sell the put. Whether or not he covered the call, that would leave him with large profit potential if the stock should rally. On the other hand, if the investor is not certain that the stock has stopped declining, he might roll just the put—or perhaps both the put and the call—down to lower strikes, thereby taking a large credit out of the position in doing so (the credit comes from selling the original put, which is now quite valuable). As a third choice, he could also consider selling some out-of-money puts against the puts that are owned. This would bring in some credit, but would expose the stock to losses below the striking price of the short puts.

On the other hand, if the underlying stock increases substantially in price after the collar has been established, the only way out of the collar is to cover the written calls—and that is going to require a (large) debit. Of course, the underlying stock has risen in price, so that is an unrealized profit that could be used to offset the loss in the calls. In essence, there is no convenient exit strategy from a collar on the upside.

In summary, one can often be quite creative with the "collar" strategy. One thing to keep in mind: if one sells options against stock that he has no intention of selling, he is actually writing *naked* calls in his own mind. That is, if one owns stock that "can't" be sold—perhaps the capital gains would be devastating or the stock has been "in the family" for a long time—then he should not sell covered calls against it, because he will be forced into treating the calls as naked (if he refuses to sell the stock). This can cause quite a bit of consternation if the underlying stock rises significantly in price—consternation that could have easily been avoided by not writing calls against the stock in the first place.

CHAPTER 18

Buying Puts in Conjunction with Call Purchases

There are several ways in which the purchases of both puts and calls can be used to the speculator's advantage. One simple method is actually a follow-up strategy for the call buyer. If the stock has advanced and the call buyer has a profit, he might consider *buying a put as a means of locking in his call profits while still allowing for more potential upside appreciation.* In Chapter 3, four basic alternatives were listed for the call buyer who had a profit: He could liquidate the call and take his profit; he could do nothing; he could "roll up" by selling the call for a profit and using part of the proceeds to purchase more out-of-the-money calls; or he could create a bull spread by selling the out-of-the-money call against the profitable call that he holds. If the underlying stock has listed puts, he has another alternative: He could buy a put. This put purchase would serve to lock in some of the profits on the call and would still allow room for further appreciation if the stock should continue to rise in price.

Example: An investor initially purchased an XYZ October 50 call for 3 points when the stock was at 48. Sometime later, after the stock had risen to 58, the call would be worth about 9 points. If there was an October 60 put, it might be selling for 4 points, and the call holder could buy this put to lock in some of his profits. His position, after purchasing the put, would be:

Long 1 October 50 call at 3 points
Long 1 October 60 put at 4 points — Net cost: 7 points

He would own a "strangle"—any position consisting of both a put and a call with differing terms—that is always worth at least 10 points. The combination will be worth exactly 10 points at expiration if XYZ is anywhere between 50 and 60. For example, if XYZ is at 52 at expiration, the call will be worth 2 points and the put will be worth 8 points. Alternatively, if the stock is at 58 at expiration, the put will be worth 2 points and the call worth 8 points. Should XYZ be above 60 at expiration, the combination's value will be equal to the call's value, since the put will expire worthless with XYZ above 60. The call would have to be worth more than 10 points in that case, since it has a striking price of 50. Similarly, if XYZ were *below* 50 at expiration, the combination would be worth more than 10 points, since the put would be more than 10 points in-the-money and the call would be worthless.

The speculator has thus created a position in which he cannot lose money, because he paid only 7 points for the combination (3 points for the call and 4 points for the put). No matter what happens, the combination will be worth at least 10 points at expiration, and a 3-point profit is thus locked in. If XYZ should continue to climb in price, the speculator could make more than 3 points of profit whenever XYZ is above 60 at expiration. Moreover, if XYZ should suddenly collapse in price, the speculator could make more than 3 points of profit if the stock was below 50 by expiration. The reader must realize that such a position can never be created as an initial position. This desirable situation arose only because the call had built up a substantial profit before the put was purchased. The similar strategy for the put buyer who might buy a call to protect his unrealized put profits was described in Chapter 16.

STRADDLE BUYING

A straddle purchase consists of buying both a put and a call with the same terms—same underlying stock, striking price, and expiration date. The straddle purchase allows the buyer to make large potential profits if the stock moves far enough in either direction. The buyer has a predetermined maximum loss, equal to the amount of his initial investment.

Example: The following prices exist:

XYZ common, 50;
XYZ July 50 call, 3; and
XYZ July 50 put, 2.

If one purchased both the July 50 call and the July 50 put, he would be buying a straddle. This would cost 5 points plus commissions. The investment required to purchase a straddle is the net debit. If the underlying stock is exactly at 50 at expiration, the buyer would lose all

his investment, since both the put and the call would expire worthless. If the stock were above 55 at expiration, the call portion of the straddle would be worth more than 5 points and the straddle buyer would make money, even though his put expired worthless. To the downside, a similar situation exists. If XYZ were below 45 at expiration, the put would be worth more than 5 points and he would have a profit despite the fact that the call expired worthless. Table 18-1 and Figure 18-1 depict the results of this example straddle purchase at expiration. The straddle buyer can immediately determine his break-even points at expiration—45 and 55 in this example. He will lose money if the underlying stock is between those break-even points at expiration. He has *potentially large profits* if XYZ should move a great distance away from 50 by expiration.

One would normally purchase a straddle on a relatively volatile stock that has the potential to move far enough to make the straddle profitable in the allotted time. This strategy is particularly attractive when option premiums are low, since low premiums will mean a cheaper straddle cost. Although *losses may occur in a relatively large percentage of cases that are held all the way until their expiration date*, there is actually only a minute probability of losing one's entire investment. Even if XYZ should be at 50 at expiration, there would still be the opportunity to sell the straddle for a small amount on the final day of trading.

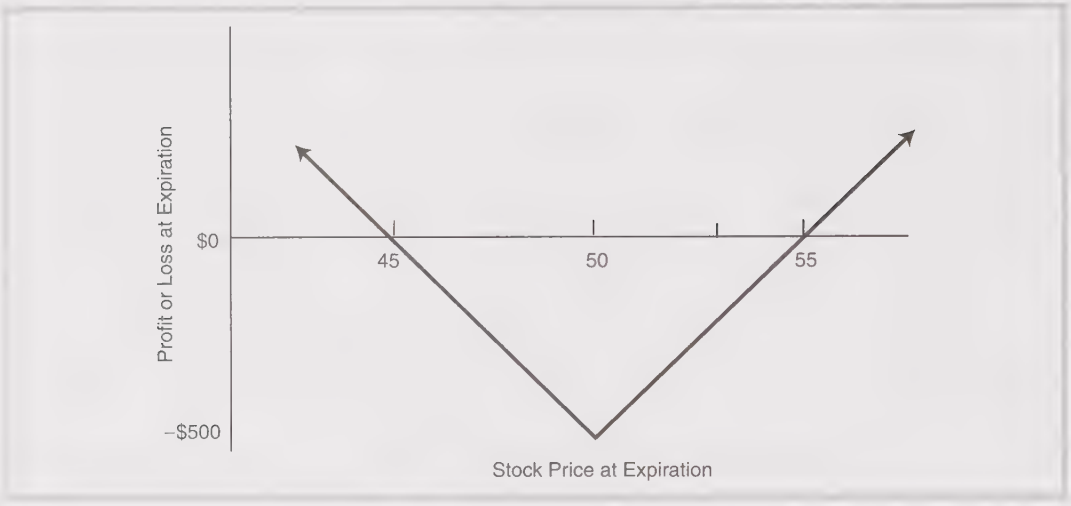
TABLE 18-1.
Results of straddle purchase at expiration.

XYZ Price at Expiration	Call Profit	Put Profit	Total Straddle Profit
30	– $ 300	+$1,800	+$1,500
40	– 300	+ 800	+ 500
45	– 300	+ 300	0
50	– 300	– 200	– 500
55	+ 200	– 200	0
60	+ 700	– 200	+ 500
70	+ 1,700	– 200	+ 1,500

EQUIVALENCES

Straddle buying is equivalent to the reverse hedge, a strategy described in Chapter 4 in which one sells the underlying stock short and purchases two calls on the underlying stock. That's the reason that the reverse hedge is called a synthetic long straddle. Both strategies have similar profit characteristics: a limited loss that would occur at the striking price of

FIGURE 18-1.
Straddle purchase.



the options involved, and potentially large profits if the underlying stock should rise or fall far enough in price. *The straddle purchase is superior to the reverse hedge with calls,* however, and where listed puts exist on a stock, the reverse hedge strategy with calls becomes obsolete. The reasons that the straddle purchase is superior are that dividends are not paid by the holder and that commission costs are smaller in the straddle situation.

REVERSE HEDGE (SYNTHETIC LONG STRADDLE) WITH PUTS

A third strategy is equivalent to both the straddle purchase and the reverse hedge with calls. It consists of buying the underlying stock and buying two put options. If the stock rises substantially in price, large profits will accrue, for the stock profit will more than offset the fixed loss on the purchase of two put options. If the stock declines in price by a large amount, profits will also be generated. In a decline, the profits generated by 2 long puts will more than offset the loss on 100 shares of long stock. This form of the straddle purchase has limited risk as well. The worst case would occur if the stock were exactly at the striking price of the puts at their expiration date—the puts would both expire worthless. The risk is limited, percentagewise and dollar-wise, since the cost of two put options would normally be a relatively small percentage of the total cost of buying the stock. Furthermore, the investor may receive some dividends if the underlying stock is a dividend-paying stock. Buying stock and buying two puts is superior to the reverse hedge strategy with calls, but is still inferior to the straddle purchase.

SELECTING A STRADDLE BUY

In theory, one could find the best straddle purchases by applying the analyses for best call purchases and best put purchases simultaneously. Then, if both the puts and calls on a particular stock showed attractive opportunity, the straddle could be bought. The straddle should be viewed as an entire position. A similar sort of analysis to that proposed for either put or call purchases could be used for straddles as well. First, one would assume the stock would move up or down in accordance with its volatility within a fixed time period, such as 60 or 90 days. Then, the prices of both the put and the call could be predicted for this stock movement. The straddles that offer the best reward opportunity under this analysis would be the most attractive ones to buy.

To demonstrate this sort of analysis, the previous example can be utilized again.

Example: XYZ is at 50 and the July 50 call is selling for 3 while the July 50 put is selling for 2 points. If the strategist is able to determine that XYZ has a 25% chance of being above 54 in 90 days and also has a 25% chance of being below 46 in 90 days, he can then predict the option prices. A rigorous method for determining what percentage chance a stock has of making a predetermined price movement is presented in Chapter 28 on mathematical applications. For now, a general procedure of analysis is more important than its actual implementation. If XYZ were at 54 in 90 days, it might be reasonable to assume that the call would be worth 5.50 and the put would be worth 1 point. The straddle would therefore be worth 6.50 points. Similarly, if the stock were at 46 in 90 days, the put might be worth 4.50 points, and the call worth 1 point, making the entire straddle worth 5.50 points. It is fairly common for the straddle to be higher-priced when it is a fixed distance in-the-money on the call side (such as 4 points) than when it is in-the-money on the put side by that same distance. In this example, the strategist has now determined that there is a 25% chance that the straddle will be worth 6.50 points in 90 days on an upside movement, and there is a 25% chance that the straddle will be worth 5.50 points on a downside movement. The average price of these two expectations is 6 points. Since the straddle is currently selling for 5 points, this would represent a 20% profit. If all potential straddles are ranked in the same manner—allowing for a 25% chance of upside and downside movement by each underlying stock—the straddle buyer will have a common basis for comparing various straddle opportunities.

FOLLOW-UP ACTION

It has been mentioned frequently that there is a good chance that a stock will remain relatively unchanged over a short time period. This does not mean that the stock will *never* move much one way or the other, but that its *net* movement over the time period will generally be small.

Example: If XYZ is currently at 50, one might say that its chances of being over 55 at the end of 90 days are fairly small, perhaps 30%. This may even be supported by mathematical analysis based on the volatility of the underlying stock. This does not imply, however, that the stock has only a 30% chance of ever reaching 55 during the 90-day period. Rather, it implies that it has only a 30% chance of being over 55 at the *end* of the 90-day period. These are two distinctly different events, with different probabilities of occurrence. Even though the probability of being over 55 at the end of 90 days might be only 30%, the probability of ever being over 55 during the 90-day period could be amazingly high, perhaps as high as 80%. It is important for the straddle buyer to understand the differences between these events occurring, for he might often be able to take *follow-up action* to improve his position.

Many times, after a straddle is bought, the underlying stock will begin to move strongly, making it appear that the straddle is immediately going to become profitable. However, just as things are going well, the stock reverses and begins to change direction, perhaps so quickly that it would now appear that the straddle will become profitable on the other side. These volatile stock movements often result in little net change, however, and at expiration the straddle buyer may have a loss. One might think that he would take profits on the call side when they became available in a quick upward movement, and then hope for a downward reversal so that he could take profits on the put side as well. *Taking small profits, however, is a poor strategy.* Straddle buying has limited losses and potentially unlimited profits. One might have to suffer through a substantial number of small losses before hitting a big winner, but the magnitude of the gain on that one large stock movement can offset many small losses. By taking small profits, the straddle buyer is immediately cutting off his chances for a substantial gain; that is why it is a poor strategy to limit the profits.

This is one of those statements that sounds easier in theory than it is in practice. It is emotionally distressing to watch the straddle gain 2 or 3 points in a short time period, only to lose that and more when the stock fails to follow through. By using a different example, it is possible to demonstrate the types of follow-up action that the straddle buyer might take.

Example: One had initially bought an XYZ January 40 straddle for 6 points when the stock was 40. After a fairly short time, the stock jumps up to 45 and the following prices exist:

XYZ common, 45:
XYZ January 40 call, 7;

XYZ January 40 put, 1; and
XYZ January 45 put, 3.

The straddle itself is now worth 8 points. The January 45 put price is included because it will be part of one of the follow-up strategies. What could the straddle buyer do at this time? First, he might do nothing, preferring to let the straddle run its course, at least for three months or so. Assuming that he is not content to sit tight, however, he might sell the call, taking his profit, and hope for the stock to then drop in price. This is an inferior course of action, since he would be cutting off potential large profits to the upside.

In the older, over-the-counter option market, one might have tried a technique known as *trading against the straddle.* Since there was no secondary market for over-the-counter options, straddle buyers often traded the stock itself against the straddle that they owned. This type of follow-up action dictated that, if the stock rose enough to make the straddle profitable to the upside, one would sell short the underlying stock. This involved no extra risk, since if the stock continued up, the straddle holder could always exercise his call to cover the short sale for a profit. Conversely, if the underlying stock fell at the outset, making the straddle profitable to the downside, one would *buy* the underlying stock. Again, this involved no extra risk if the stock continued down, since the put could always be exercised to sell the stock at a profit. The idea was to be able to capitalize on large stock price reversals with the addition of the stock position to the straddle. This strategy worked best for the brokers, who made numerous commissions as the trader tried to gauge the whipsaws in the market. In the listed options market, the same strategic effect can be realized (without as large a commission expense) by merely selling out the long call on an upward move, and using part of the proceeds to buy a second put similar to the one already held. On a downside move, one could sell out the long put for a profit and buy a second call similar to the one he already owns. In the example above, the call would be sold for 7 points and a second January 40 put purchased for 1 point. This would allow the straddle buyer to recover his initial 6-point cost and would allow for large downside profit potential. This strategy is not recommended, however, since the straddle buyer is limiting his profit in the direction that the stock is moving. Once the stock has moved from 40 to 45, as in this example, it would be more reasonable to expect that it could continue up rather than experience a drop of more than 5 points.

A more desirable sort of follow-up action would be one whereby the straddle buyer could retain much of the profit already built up without limiting further potential profits if the stock continues to run. In the example above, the straddle buyer could use the January 45 put—the one at the higher price—for this purpose.

Example: Suppose that when the stock got to 45, he sold the put that he owned, the January 40, for 1 point, and simultaneously bought the January 45 put for 3 points. This transaction would cost 2 points, and would leave him in the following position:

Long 1 January 40 call
Long 1 January 45 put – Combined cost: 8 points

He now owns a combination at a cost of 8 points. However, no matter where the underlying stock is at expiration, this combination will be worth at least 5 points, since the put has a striking price 5 points higher than the call's striking price. In fact, if the stock is above 45 at expiration or is below 40 at expiration, the straddle will be worth more than 5 points. This follow-up action has not limited the potential profits. If the stock continues to rise in price, the call will become more and more valuable. On the other hand, if the stock reverses and falls dramatically, the put will become quite valuable. In either case, the opportunity for large potential profits remains. Moreover, the investor has improved his risk exposure. The most that the new position can lose at expiration is 3 points, since the combination cost 8 points originally, and can be sold for 5 points at worst.

To summarize, *if the underlying stock moves up to the next strike, the straddle buyer should consider rolling his put up*, selling the one that he is long and buying the one at the next higher striking price. Conversely, *if the stock starts out with a downward move, he should consider rolling the call down*, selling the one that he is long and buying the one at the next lower strike. In either case, he reduces his risk exposure without limiting his profit potential—exactly the type of follow-up result that the straddle buyer should be aiming for.

BUYING A STRANGLE

A strangle is a position that consists of both a put and a call, which generally have the same expiration date, but different striking prices. The following example depicts a strangle.

Example: One might buy a strangle consisting of an XYZ January 45 put and an XYZ January 50 call. Buying such a strangle is quite similar to buying a straddle, although there are some differences, as the following discussion will demonstrate. Suppose the following prices exist:

XYZ common, 47;
XYZ January 45 put, 2; and
XYZ January 50 call, 2.

In this example, both options are out-of-the-money when purchased. This, again, is the most normal application of the strangle purchase. If XYZ is still between 45 and 50 at January expiration, both options will expire worthless and the strangle buyer will lose his entire investment. This investment—$400 in the example—is generally smaller than that required to buy a straddle on XYZ. If XYZ moves in either direction, rising above 50 or falling below 45, the strangle will have some value at expiration. In this example, if XYZ is above 54 at expiration, the call will be worth more than 4 points (the put will expire worthless) and the buyer will make a profit. In a similar manner, if XYZ is below 41 at expiration, the put will have a value greater than 4 points and the buyer would make a profit in that case as well. *The potential profits are quite large if the underlying stock should move a great deal before the options expire.* Table 18-2 and Figure 18-2 depict the potential profits or losses from this position at January expiration. The maximum loss is possible over a much wider range than that of a straddle. The straddle achieves its maximum loss only if the stock is exactly at the striking price of the options at expiration. However, the strangle has its maximum loss anywhere between the two strikes at expiration. The actual amount of the loss is smaller for the strangle, and that is a compensating factor. The potential profits are large for both strategies.

The example above is one in which both options are out-of-the-money. It is also possible to construct a very similar position by utilizing in-the-money options.

Example: With XYZ at 47 as before, the in-the-money options might have the following prices: XYZ January 45 call, 4; and XYZ January 50 put, 4. If one purchased this *in-the-money*

TABLE 18-2.
Results at expiration of a strangle purchase.

XYZ Price at Expiration	Put Profit	Call Profit	Total Profit
25	+$1,800	−$ 200	+$1,600
35	+ 800	− 200	+ 600
41	+ 200	− 200	0
43	0	− 200	− 200
45	− 200	− 200	− 400
47	− 200	− 200	− 400
50	− 200	− 200	− 400
54	− 200	+ 200	0
60	− 200	+ 800	+ 600
70	− 200	+ 1,800	+ 1,600