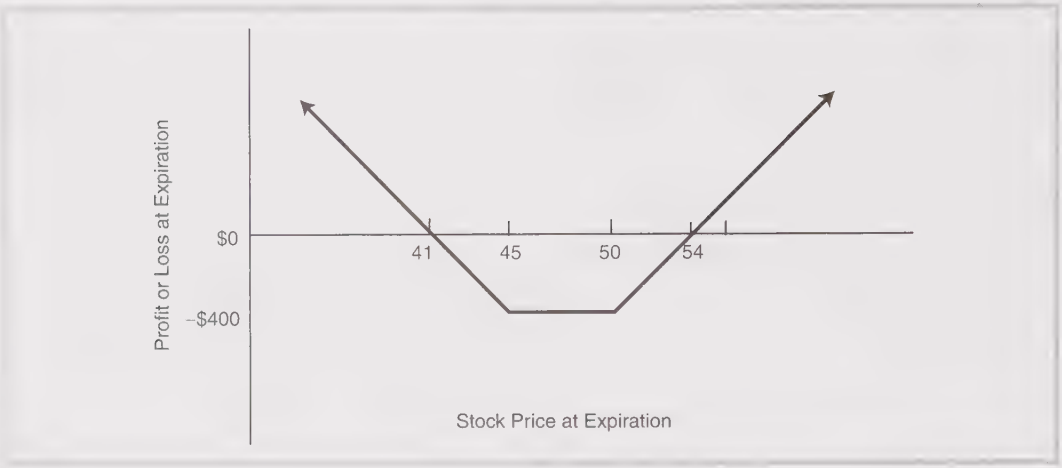
FIGURE 18-2.
Strangle purchase.



strangle, he would pay a total cost of 8 points. However, the value of this strangle will always be at least 5 points, since the striking price of the put is 5 points higher than that of the call. The reader has seen this sort of position before, when protective follow-up strategies for straddle buying and for call or put buying were described. Because the strangle will always be worth at least 5 points, the most that the in-the-money strangle buyer can lose is 3 points in this example. His potential profits are still unlimited should the underlying stock move a large distance. Thus, even though it requires a larger initial investment, *the in-the-money strangle may often be a superior strategy to the out-of-the-money strangle, from a buyer's viewpoint.* The in-the-money strangle purchase certainly involves less percentage risk: The buyer can never lose all his investment, since he can always get back 5 points, even in the worst case (when XYZ is between 45 and 50 at expiration). His percentage profits are lower with the in-the-money strangle purchase, since he paid more for the strangle to begin with. These observations should come as no surprise, since when the outright purchase of a call was discussed, it was shown that the purchase of an in-the-money call was more conservative than the purchase of an out-of-the-money call, in general. The same was true for the outright purchase of puts, perhaps even more so, because of the smaller time value of an in-the-money put. Therefore, the strangle created by the two—an in-the-money call and an in-the-money put—should be more conservative than the out-of-the-money strangle.

If the underlying stock moves quickly in either direction, the strangle buyer may sometimes be able to take action to protect some of his profits. He would do so in a manner similar to that described for the straddle buyer. For example, if the stock moved up quickly, he could sell the put that he originally bought and buy the put at the next higher

striking price in its place. If he had started from an out-of-the-money strangle position, this would then place him in a straddle. The strategist should not blindly take this sort of follow-up action, however. It may be overly expensive to "roll up" the put in such a manner, depending on the amount of time that has passed and the actual option prices involved. Therefore, it is best to analyze each situation on a case-by-case basis to see whether it is logical to take any follow-up action at all.

As a final point, the out-of-the-money strangles may appear deceptively cheap, both options selling for fractions of a point as expiration nears. However, the probability of realizing the maximum loss equal to one's initial investment is fairly large with strangles. This is distinctly different from straddle purchases, whereby the probability of losing the entire investment is small. The aggressive speculator should not place a large portion of his funds in out-of-the-money strangle purchases. The percentage risk is smaller with the in-the-money strangle, being equal to the amount of time value premium paid for the options initially, but commission costs will be somewhat larger. In either case, the underlying stock still needs to move by a relatively large amount in order for the buyer to profit.

CHAPTER 19

The Sale of a Put

The buyer of a put stands to profit if the underlying stock drops in price. As might then be expected, the seller of a put will make money if the underlying stock increases in price. The uncovered sale of a put is a more common strategy than the covered sale of a put, and is therefore described first. It is a bullishly oriented strategy.

THE UNCOVERED PUT SALE

Since the buyer of a put has a right to sell stock at the striking price, the writer of a put is obligating himself to buy that stock at the striking price. For assuming this obligation, he receives the put option premium. If the underlying stock advances and the put expires worthless, the put writer will not be assigned and *he could make a maximum profit equal to the premium received.* He has large downside risk, since the stock could fall substantially, thereby increasing the value of the written put and causing large losses to occur. An example will aid in explaining these general statements about risk and reward.

Example: XYZ is at 50 and a 6-month put is selling for 4 points. The naked put writer has a fixed potential profit to the upside—$400 in this example—and a large potential loss to the downside (Table 19-1 and Figure 19-1). This downside loss is limited only by the fact that a stock cannot go below zero.

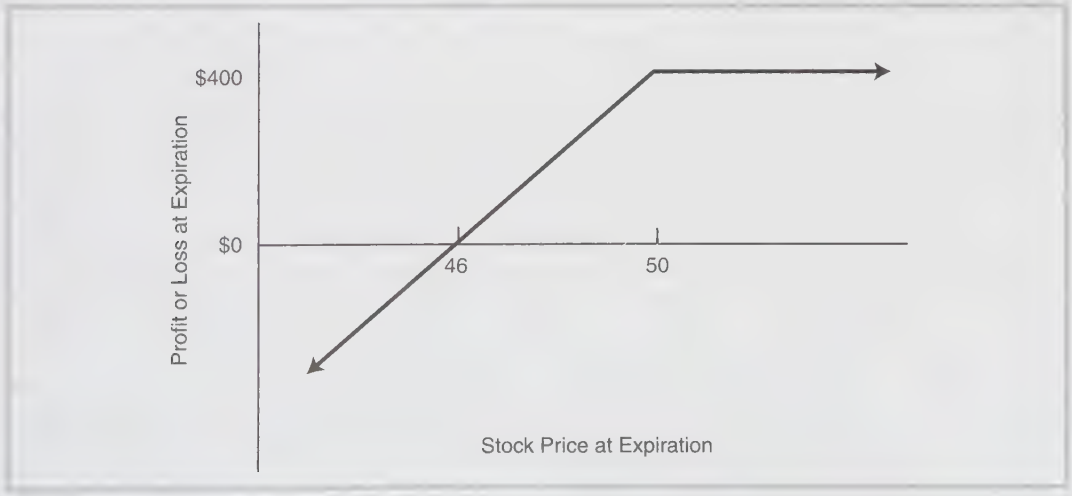
The collateral requirement for writing naked puts is the same as that for writing naked calls. The requirement is equal to 20% of the current stock price plus the put premium minus any out-of-the-money amount.

Example: If XYZ is at 50, the collateral requirement for writing a 4-point put with a striking price of 50 would be $1,000 (20% of 5,000) plus $400 for the put premium for

TABLE 19-1.
Results from the sale of an uncovered put.

XYZ Price at Expiration	Put Price at Expiration (Parity)	Put Sale Profit
30	20	–$1,600
40	10	– 600
46	4	0
50	0	+ 400
60	0	+ 400
70	0	+ 400

FIGURE 19-1.
Uncovered sale of a put.



a total of $1,400. If the stock were above the striking price, the striking price differential would be subtracted from the requirement. The minimum requirement is 10% of the put's *striking price*, plus the put premium, even if the computation above yields a smaller result.

The uncovered put writing strategy is similar in many ways to the covered call writing strategy. Note that the profit graphs have the same shape; this means that the two strategies are equivalent. It may be helpful to the reader to describe the aspects of naked put writing by comparing them to similar aspects of covered call writing.

In either strategy, one needs to be somewhat bullish, or at least neutral, on the underlying stock. If the underlying stock moves upward, the uncovered put writer will make a profit, possibly the entire amount of the premium received. If the underlying stock should be unchanged at expiration—a neutral situation—the put writer will profit by the amount of the time value premium received when he initially wrote the put. This could represent the maximum profit if the put was out-of-the-money initially, since that would mean that the entire put premium was composed of time value premium. For an in-the-money put, however, the time value premium would represent something less than the entire value of the option. These are similar qualities to those inherent in covered call writing. If the stock moves up, the covered call writer can make his maximum profit. However, if the stock is unchanged at expiration, he will make his maximum profit only if the stock is above the call's striking price. So, *in either strategy, if the position is established with the stock above the striking price, there is a greater probability of achieving the maximum profit.* This represents the less aggressive application: writing an out-of-the-money put initially, which is equivalent to the covered write of an in-the-money call.

The more aggressive application of naked put writing is to write an in-the-money put initially. The writer will receive a larger amount of premium dollars for the in-the-money put and, if the underlying stock advances far enough, he will thus make a large profit. By increasing his profit potential in this manner, he assumes more risk. If the underlying stock should fall, the in-the-money put writer will lose money more quickly than one who initially wrote an out-of-the-money put. Again, these facts were demonstrated much earlier with covered call writing. An in-the-money covered call write affords more downside protection but less profit potential than does an out-of-the-money covered call write.

It is fairly easy to summarize all of this by noting that in either the naked put writing strategy or the covered call writing strategy, *a less aggressive position is established when the stock is higher than the striking price of the written option. If the stock is below the striking price initially, a more aggressive position is created.*

There are, of course, some basic differences between covered call writing and naked put writing. First, the naked put write will generally require a smaller investment, since one is only collateralizing 20% of the stock price plus the put premium, as opposed to 50% for the covered call write on margin. Also, the naked put writer is not actually investing cash; collateral is used, so he may finance his naked put writing through the value of his present portfolio, whether it be stocks, bonds, or government securities. However, any losses would create a debit and might therefore cause him to disturb a portion of this portfolio. It should be pointed out that one *can*, if he wishes, write naked puts in a cash account by depositing cash or cash equivalents equal to the striking price of the put. This

is called "cash-based put writing." The covered call writer receives the dividends on the underlying stock, but the naked put writer does not. In certain cases, this may be a substantial amount, but it should also be pointed out that the puts on a high-yielding stock will have more value and the naked put writer will thus be taking in a higher premium initially. From strictly a rate of return viewpoint, naked put writing is superior to covered call writing. Basically, there is a different psychology involved in writing naked puts than that required for covered call writing. The covered call write is a comfortable strategy for most investors, since it involves common stock ownership. Writing naked options, however, is a more foreign concept to the average investor, even if the strategies are equivalent. Therefore, it is relatively unlikely that the same investor would be a participant in both strategies.

FOLLOW-UP ACTION

The naked put writer would take protective follow-up action if the underlying stock drops in price. His simplest form of follow-up action is to close the position at a small loss if the stock drops. Since in-the-money puts tend to lose time value premium rapidly, he may find that his loss is often quite small if the stock goes against him. In the example above, XYZ was at 50 with the put at 4. If the stock falls to 45, the writer may be able to quite easily repurchase the put for 5.50 or 6 points, thereby incurring a fairly small loss.

In the covered call writing strategy, it was recommended that the strategist roll down wherever possible. One reason for doing so, rather than closing the covered call position, is that stock commissions are quite large and one cannot generally afford to be moving in and out of stocks all the time. It is more advantageous to try to preserve the stock position and roll the calls down. This commission disadvantage does not exist with naked put writing. When one closes the naked put position, he merely buys in the put. Therefore, *rolling down is not as advantageous for the naked put writer.* For example, in the paragraph above, the put writer buys in the put for 5.50 or 6 points. He could roll down by selling a put with striking price 45 at that time. However, there may be better put writing situations in other stocks, and there should be no reason for him to continue to preserve a position in XYZ stock.

In fact, this same reasoning can be applied to any sort of rolling action for the naked put writer. It is extremely advantageous for the covered call writer to roll forward; that is, to buy back the call when it has little or no time value premium remaining in it and sell a longer-term call at the same striking price. By doing so, he takes in additional premium without having to disturb his stock position at all. However, the naked put writer has little

advantage in rolling forward. He can also take in additional premium, but when he closes the initial uncovered put, he should then evaluate other available put writing positions before deciding to write another put on the same underlying stock. His commission costs are the same if he remains in XYZ stock or if he goes on to a put writing position in a different stock.

EVALUATING A NAKED PUT WRITE

The computation of potential returns from a naked put write is not as straightforward as were the computations for covered call writing. The reason for this is that the collateral requirement changes as the stock moves up or down, since any naked option position is marked to the market. *The most conservative approach is to allow enough collateral in the position in case the underlying stock should fall*, thus increasing the requirement. In this way, the naked put writer would not be forced to prematurely close a position because he cannot maintain the margin required.

Example: XYZ is at 50 and the October 50 put is selling for 4 points. The initial collateral requirement is 20% of 50 plus $400, or $1,400. There is no additional requirement, since the stock is exactly at the striking price of the put. Furthermore, let us assume that the writer is going to close the position should the underlying stock fall to 43. To maintain his put write, he should therefore allow enough margin to collateralize the position if the stock were at 43. The requirement at that stock price would be $1,560 (20% of 43 plus at least 7 points for the in-the-money amount). Thus, the put writer who is establishing this position should allow $1,560 of collateral value for each put written. Of course, this collateral requirement can be reduced by the amount of the proceeds received from the put sale, $400 per put less commissions in this example. If we assume that the writer sells 5 puts, his gross premium inflow would be $2,000 and his commission expense would be about $75, for a net premium of $1,925.

Once this information has been determined, it is a simple matter to determine the maximum potential return and also the downside break-even point. To achieve the maximum potential return, the put would expire worthless with the underlying stock above the striking price. Therefore, the maximum potential profit is equal to the net premium received. The return is merely that profit divided by the collateral used. In the example above, the maximum potential profit is $1,925. The collateral required is $1,560 per put (allowing for the stock to drop to 43) or $7,800 for 5 puts, reduced by the $1,925 premium received, for a total requirement of $5,875. The potential return is then $1,925 divided by $5,875, or 32.8%. Table 19-2 summarizes these calculations.

TABLE 19-2.
Calculation of the potential return of uncovered put writing.

XYZ: 50	
XYZ January 50 put: 4	
Potential profit:	
Sell 5 puts	$2,000
Less commissions	– 75
Potential maximum profit (premium received)	$1,925
Break-even point:	
Striking price	$50.00
Less premium per put ($1,925/5)	– 3.85
Break-even stock price	46.15
Collateral required (allowing for stock to drop to 43):	
20% of 43	$ 860
Plus put premium	+ 700
	$1,560
	× 5
Requirement for 5 puts	$7,800
Less premium received	– 1,925
Net collateral	$5,875
Potential return:	
Premium divided by net collateral	$1,925/$5,875 = 32.8%

There are differences of opinion on how to compute the potential returns from naked put writing. The method presented above is a more conservative one in that it takes into consideration a larger collateral requirement than the initial requirement. Of course, since one is not really investing cash, but is merely using the collateral value of his present portfolio, it may even be correct to claim that one has no investment at all in such a position. This may be true, but it would be impossible to compare various put writing opportunities without having a return computation available.

One other important feature of return computations is the return if unchanged. If the put is initially out-of-the-money, the return if unchanged is the same as the maximum potential return. However, if the put is initially in-the-money, the computation must

take into consideration what the writer would have to pay to buy back the put when it expires.

Example: XYZ is 48 and the XYZ January 50 put is selling for 5 points. The profit that could be made if the stock were unchanged at expiration would be only 3 points, less commissions, since the put would have to be repurchased for 2 points with XYZ at 48 at expiration. Commissions for the buy-back should be included as well, to make the computation as accurate as possible.

As was the case with covered call writing, one can create several rankings of naked put writes. One list might be the *highest potential returns*. Another list could be the put writes that provide the *most downside protection*; that is, the ones that have the least chance of losing money. Both lists need some screening applied to them, however. When considering the maximum potential returns, one should take care to ensure at least some room for downside movement.

Example: If XYZ were at 50, the XYZ January 100 put would be selling at 50 also and would most assuredly have a tremendously large maximum potential return. However, there is no room for downside movement at all, and one would surely not write such a put. One simple way of allowing for such cases would be to reject any put that did not offer at least 5% downside protection. Alternatively, *one could also reject situations in which the return if unchanged is below 5%.*

The other list, involving maximum downside protection, also must have some screens applied to it.

Example: With XYZ at 70, the XYZ January 50 put would be selling for .50 at most. Thus, it is extremely unlikely that one would lose money in this situation; the stock would have to fall 20 points for a loss to occur. However, there is practically nothing to be made from this position, and one would most likely not ever write such a deeply out-of-the-money put.

A minimum acceptable level of return must accompany the items on this list of put writes. For example, one might decide that the return would have to be at least 12% on an annualized basis in order for the put write to be on the list of positions offering the most downside protection. Such a requirement would preclude an extreme situation like that shown above. Once these screens have been applied, the lists can then be ranked in a normal manner. The put writes offering the highest returns would be at the top of the more aggressive list, and those offering the highest percentage of downside protection would be at the top of the more conservative list. In the strictest sense, a more advanced technique

to incorporate the volatility of the underlying stock should rightfully be employed. As mentioned previously, that technique is presented in Chapter 28 on mathematical applications.

BUYING STOCK BELOW ITS MARKET PRICE

In addition to viewing naked put writing as a strategy unto itself, as was the case in the previous discussion, *some investors who actually want to acquire stock will often write naked puts as well.*

Example: XYZ is a $60 stock and an investor feels it would be a good buy at 55. He places an open buy order with a limit of 55. Three months later, XYZ has drifted down to 57 but no lower. It then turns and rises heavily, but the buy limit was never reached, and the investor misses out on the advance.

This hypothetical investor could have used a naked put to his advantage. Suppose that when XYZ was originally at 60, this investor wrote a naked three-month put for 5 points instead of placing an open buy limit order. Then, if XYZ is anywhere below 60 at expiration, he will have stock put to him at 60. That is, he will have to buy stock at 60. However, since he received 5 points for the put sale, his net cost for the stock is 55. Thus, even if XYZ is at 57 at expiration and has never been any lower, the investor can still buy XYZ for a net cost of 55.

Of course, if XYZ rose right away and was above 60 at expiration, the put would not be assigned and the investor would not own XYZ. However, he would still have made $500 from selling the put, which is now worthless. The put writer thus assumes a more active role in his investments by acting rather than waiting. He receives at least some compensation for his efforts, even though he did not get to buy the stock.

If, instead of rising, XYZ fell considerably, say to 40 by expiration, the investor would be forced to purchase stock at a net cost of 55, thereby giving himself an immediate paper loss. He was, however, going to buy stock at 55 in any case, so the put writer and the investor using a buy limit have the same result in this case. Critics may point out that any buy order for common stock may be canceled if one's opinion changes about purchasing the stock. The put writer, of course, may do the same thing by closing out his obligation through a closing purchase of the put.

This technique is useful to many types of investors who are oriented toward eventually owning the stock. Large portfolio managers as well as individual investors may find the sale of puts useful for this purpose. *It is a method of attempting to accumulate a stock position at prices lower than today's market price.* If the stock rises and the stock is not bought, the investor will at least have received the put premium as compensation for his efforts.

SOME CAUTION IS REQUIRED

Despite the seemingly benign nature of naked put writing, it can be a highly dangerous strategy for two reasons: (1) Large losses are possible if the underlying stock takes a nasty fall, and (2) collateral requirements are small, so it is possible to utilize a great deal of leverage. It may seem like a good idea to write out-of-the-money puts on "quality" stocks that you "wouldn't mind owning." However, any stock is subject to a crushing decline. In almost any year there are serious declines in one or more of the largest stocks in America (IBM in 1991, Procter and Gamble in 1999, and Xerox in 1999, just to name a few). If one happens to be short puts on such stocks—and worse yet, if he happens to have overextended himself because he had the initial margin required to sell a great deal of puts—then he could actually be wiped out on such a decline. Therefore, do not leverage your account heavily in the naked put strategy, regardless of the "quality" of the underlying stock.

THE COVERED PUT SALE

By definition, a put sale is covered only if the investor also owns a corresponding put with striking price equal to or greater than the strike of the written put. This is a spread. However, *for margin purposes, one is covered if he sells a put and is also short the underlying stock*. The margin required is strictly that for the short sale of the stock; there is none required for the short put. This creates a position with limited profit potential that is obtained if the underlying stock is anywhere below the striking price of the put at expiration. There is unlimited upside risk, since if the underlying stock rises, the short sale of stock will accrue losses, while the profit from the put sale is limited. This is really a position equivalent to a naked call write, except that the covered put writer must pay out the dividend on the underlying stock, if one exists. The naked sale of a call also has an advantage over this strategy in that commission costs are considerably smaller. In addition, the time value premium of a call is generally higher than that of a put, so that the naked call writer is taking in more time premium. The covered put sale is a little-used strategy that appears to be inferior to naked call writing. As a result, the strategy is not described more fully.

RATIO PUT WRITING

A ratio put write involves the short sale of the underlying stock plus the sale of 2 puts for each 100 shares sold short. This strategy has a profit graph exactly like that of a ratio call write, achieving its maximum profit at the striking price of the written options, and having large potential losses if the underlying stock should move too far in either direction.

The ratio call write is a highly superior strategy, however, for the reasons just outlined. The ratio call writer receives dividends while the ratio put writer would have to pay them out. In addition, the ratio call writer will generally be taking in larger amounts of time value premium, because calls have more time premium than puts do. Therefore, the ratio put writing strategy is not a viable one.

CHAPTER 20

The Sale of a Straddle

Selling a straddle involves selling both a put and a call with the same terms. As with any type of option sale, the straddle sale may be either covered or uncovered. Both uses are fairly common. The covered sale of a straddle is very similar to the covered call writing strategy and would generally appeal to the same type of investor. The uncovered straddle write is more similar to ratio call writing, and is attractive to the more aggressive strategist who is interested in selling large amounts of time premium in hopes of collecting larger profits if the underlying stock remains fairly stable.

THE COVERED STRADDLE WRITE

In this strategy, *one owns the underlying stock and simultaneously writes a straddle on that stock*. This may be particularly appealing to investors who are already involved in covered call writing. In reality, this position is not totally covered—only the sale of the call is covered by the ownership of the stock. The sale of the put is uncovered. However, the name "covered straddle" is generally used for this type of position in order to distinguish it from the uncovered straddle write.

Example: XYZ is at 51 and an XYZ January 50 call is selling for 5 points while an XYZ January 50 put is selling for 4 points. A covered straddle write would be established by buying 100 shares of the underlying stock and simultaneously selling one put and one call. The similarity between this position and a covered call writer's position should be obvious. The covered straddle write is actually a covered write—long 100 shares of XYZ plus short one call—coupled with a naked put write. Since the naked put write has already been shown to be equivalent to a covered call write, *this position is quite similar to a 200-share*

covered call write. In fact, all the profit and loss characteristics of a covered call write are the same for the covered straddle write. There is limited upside profit potential and potentially large downside risk.

Readers will remember that the sale of a naked put is *equivalent* to a covered call write. Hence, a covered straddle write can be thought of either as the equivalent of a 200-share covered call write, *or as the sale of two uncovered puts.* In fact, there is some merit to the strategy of selling two puts instead of establishing a covered straddle write. Commission cost would be smaller in that case, and so would the initial investment required (although the introduction of leverage is not always a good thing).

The maximum profit is attained if XYZ is anywhere above the striking price of 50 at expiration. The amount of maximum profit in this example is $800: the premium received from selling the straddle, less the 1-point loss on the stock if it is called away at 50. In fact, the maximum profit potential of a covered straddle write is quickly computed using the following formula:

Maximum profit = Straddle premium + Striking price − Initial stock price

The break-even point in this example is 46. Note that the covered writing portion of this example—buying stock at 51 and selling a call for 5 points—has a break-even point of 46. The naked put portion of the position has a break-even point of 46 as well, since the January 50 put was sold for 4 points. Therefore, the combined position—the covered straddle write—must have a break-even point of 46. Again, this observation is easily defined by an equation:

$$\text{Break-even price} = \frac{\text{Stock price} + \text{Strike price} - \text{Straddle premium}}{2}$$

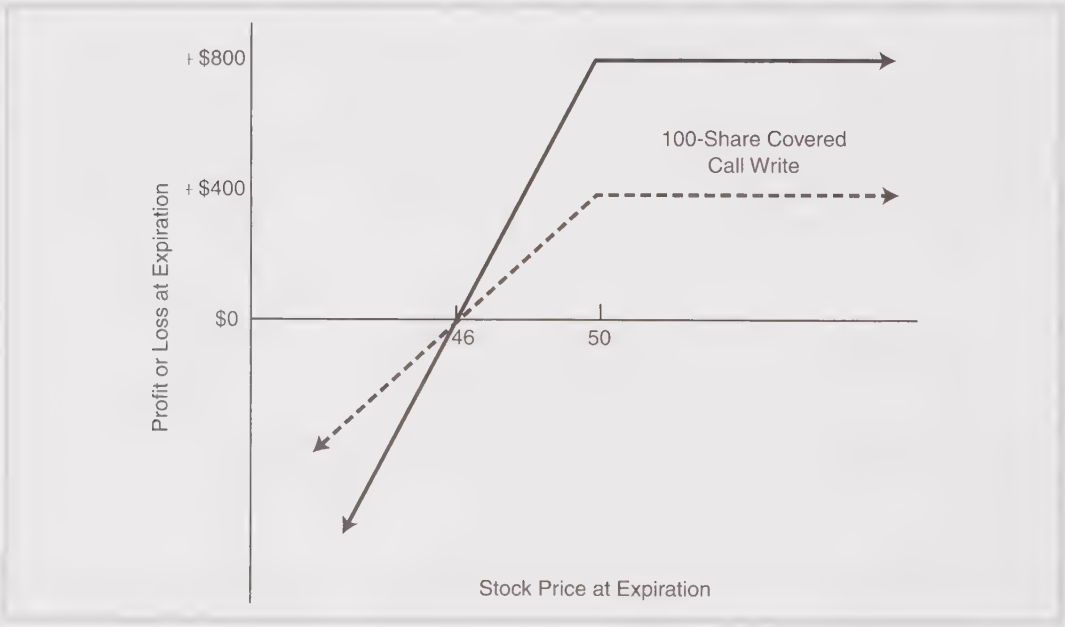
Table 20-1 and Figure 20-1 compare the covered straddle write to a 100-share covered call write of the XYZ January 50 at expiration.

The attraction for the covered call writer to become a covered straddle writer is that he may be able to increase his return without substantially altering the parameters of his covered call writing position. Using the prices in Table 20-1, if one had decided to establish a covered write by buying XYZ at 51 and selling the January 50 call at 5 points, he would have a position with its maximum potential return anywhere above 50 and with a break-even point of 46. By adding the naked put to his covered call position, he does not change the price parameters of his position; he still makes his maximum profit anywhere above 50 and he still has a break-even point of 46. Therefore, he does not have to change his outlook on the underlying stock in order to become a covered straddle writer.

TABLE 20-1.
Results at expiration of covered straddle write.

Stock Price	(A) 100-Share Covered Write	(B) Put Write	Covered Straddle Write (A + B)
35	–$1,100	–$1,100	–$2,200
40	– 600	– 600	– 1,200
46	0	0	0
50	+ 400	+ 400	+ 800
60	+ 400	+ 400	+ 800

FIGURE 20-1.
Covered straddle write.



The investment is increased by the addition of the naked put, as are the potential dollars of profit if the stock is above 50 and the potential dollars of loss if the stock is below 46 at expiration. The covered straddle writer loses money twice as fast on the downside, since his position is similar to a 200-share covered write. Because the commissions are smaller for the naked put write than for the covered call write, the covered call writer who adds a naked put to his position will generally increase his return somewhat.

Follow-up action can be implemented in much the same way it would be for a covered call write. Whenever one would normally roll his call in a covered situation, he now rolls the entire straddle—rolling down for protection, rolling up for an increase in profit potential, and rolling forward when the time value premium of the straddle dissipates. Rolling up or down would probably involve debits, unless one rolled to a longer maturity.

Some writers might prefer to make a slight adjustment to the covered straddle writing strategy. Instead of selling the put and call at the same price, they prefer to sell an out-of-the-money put against the covered call write. That is, if one is buying XYZ at 50 and selling the call, he might then also sell a put at 45. This would increase his upside profit potential and would allow for the possibility of both options expiring worthless if XYZ were anywhere between 45 and 50 at expiration. Such action would, of course, increase the potential dollars of risk if XYZ fell below 45 by expiration, but the writer could always roll the call down to obtain additional downside protection.

One final point should be made with regard to this strategy. The covered call writer who is writing on margin and is fully utilizing his borrowing power for call writing will have to add additional collateral in order to write covered straddles. This is because the put write is uncovered. However, the covered call writer who is operating on a cash basis can switch to the covered straddle writing strategy without putting up additional funds. He merely needs to move his stock to a margin account and use the collateral value of the stock he already owns in order to sell the puts necessary to implement the covered straddle writes.

THE UNCOVERED STRADDLE WRITE

In an uncovered straddle write, *one sells the straddle without owning the underlying stock*. In broad terms, this is a neutral strategy with limited profit potential and large risk potential. However, the probability of making a profit is generally quite large, and methods can be implemented to reduce the risks of the strategy.

Since one is selling both a put and a call in this strategy, he is initially taking in large amounts of time value premium. If the underlying stock is relatively unchanged at expiration, the straddle writer will be able to buy the straddle back for its intrinsic value, which would normally leave him with a profit.

Example: The following prices exist:

XYZ common, 45;
XYZ January 45 call, 4; and
XYZ January 45 put, 3.

A straddle could be sold for 7 points. If the stock were above 38 and below 52 at expiration, the straddle writer would profit, since the in-the-money option could be bought back for less than 7 points in that case, while the out-of-the-money option expires worthless (Table 20-2).

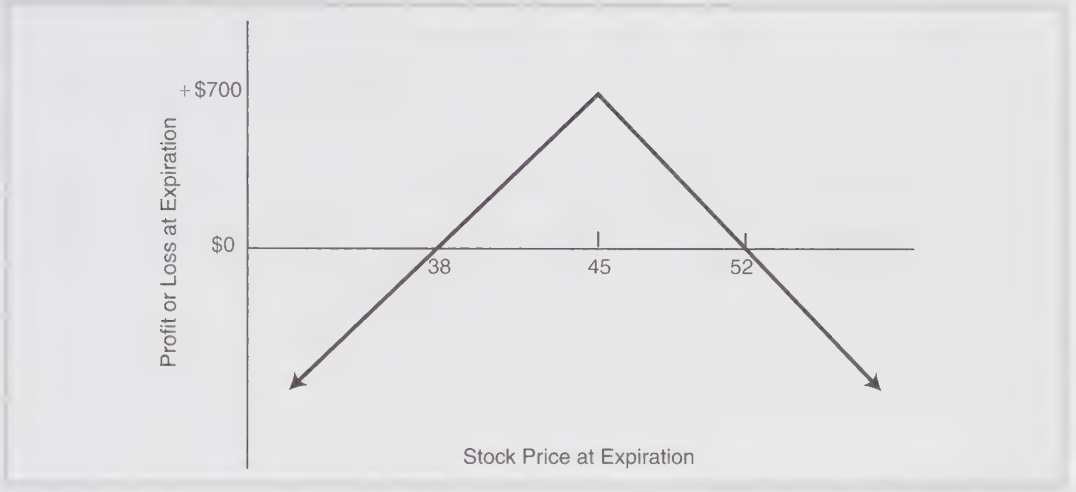
TABLE 20-2.
The naked straddle write.

XYZ Price at Expiration	Call Profit	Put Profit	Total Profit
30	+$ 400	–$1,200	–$800
35	+ 400	– 700	– 300
38	+ 400	– 400	0
40	+ 400	– 200	+ 200
45	+ 400	+ 300	+ 700
50	– 100	+ 300	+ 200
52	– 300	+ 300	0
55	– 600	+ 300	– 300
60	– 1,100	+ 300	– 800

Notice that Figure 20-2 has a shape like a roof. *The maximum potential profit point is at the striking price at expiration, and large potential losses exist in either direction if the underlying stock should move too far.* The reader may recall that the ratio call writing strategy—buying 100 shares of the underlying stock and selling two calls—has the same profit graph. These two strategies, the naked straddle write and the ratio call write, are equivalent. The two strategies do have some differences, of course, as do all equivalent strategies; but they are similar in that both are highly probabilistic strategies that can be somewhat complex. In addition, both have large potential risks under adverse market conditions or if follow-up strategies are not applied.

The investment required for a naked straddle is the greater of the requirement on the call or the put. In general, this means that the margin requirement is equal to the requirement for the in-the-money option in a simple naked write. This requirement is 20% of the stock price plus the in-the-money option premium. *The straddle writer should allow enough collateral so that he can take whatever follow-up actions he deems necessary without having to incur a margin call.* If he is intending to close out the straddle if the stock should reach the upside break-even point—52 in the example above—then he should allow enough collateral to finance the position with the stock at 52. If,

FIGURE 20-2.
Naked straddle sale.



however, he is planning to take other action that might involve staying with the position if the stock goes to 55 or 56, he should allow enough collateral to be able to finance that action. If the stock never gets that high, he will have excess collateral while the position is in place.

SELECTING A STRADDLE WRITE

Ideally, one would like to receive a premium for the straddle write that produces a profit range that is wide in relation to the volatility of the underlying stock. In the example above, the profit range is 38 to 52. This may or may not be extraordinarily wide, depending on the volatility of XYZ. This is a somewhat subjective measurement, although one could construct a simple straddle writer's index that ranked straddles based on the following simple formula:

$$\text{Index} = \frac{\text{Straddle time value premium}}{\text{Stock price} \times \text{Volatility}}$$

Refinements would have to be made to such a ranking, such as eliminating cases in which either the put or the call sells for less than ½ point (or even 1 point, if a more restrictive requirement is desired) or cases in which the in-the-money time premium is small. Furthermore, the index would have to be annualized to be able to compare straddles for

different expiration months. More advanced selection criteria, in the form of an expected return analysis, will be presented in Chapter 28 on mathematical applications.

More screens can be added to produce a more conservative list of straddle writes. For example, one might want to ignore any straddles that are not worth at least a fixed percentage, say 10%, of the underlying stock price. Also, straddles that are too short-term, such as ones with less than 30 days of life remaining, might be thrown out as well. The remaining list of straddle writing candidates should be ones that will provide reasonable returns under favorable conditions, and also should be readily adaptable to some of the follow-up strategies discussed later. Finally, one would generally like to have some amount of technical support at or above the lower break-even price and some technical resistance at or below the upper break-even point. Thus, once the computer has generated a list of straddles ranked by an index such as the one listed above, the straddle writer can further pare down the list by looking at the technical pictures of the underlying stocks.

FOLLOW-UP ACTION

The risks involved in straddle writing can be quite large. When market conditions are favorable, one can make considerable profits, even with restrictive selection requirements, and even by allowing considerable extra collateral for adverse stock movements. However, in an extremely volatile market, especially a bullish one, losses can occur rapidly and follow-up action must be taken. Since the time premium of a put tends to shrink when it goes into-the-money, there is actually slightly less risk to the downside than there is to the upside. In an extremely bullish market, the time value premiums of call options will not shrink much at all and might even expand. This may force the straddle writer to pay excessive amounts of time value premium to buy back the written straddle, especially if the movement occurs well in advance of expiration.

The simplest from of follow-up action is to buy the straddle back when and if the underlying stock reaches a break-even point. The idea behind doing so is to limit the losses to a small amount, because the straddle should be selling for only slightly more than its original value when the stock has reached a break-even point. In practice, there are several flaws in this theory. If the underlying stock arrives at a break-even point well in advance of expiration, the amount of time value premium remaining in the straddle may be extremely large and the writer will be losing a fairly large amount by repurchasing the straddle. Thus, a break-even point at expiration is probably a loss point prior to expiration.

Example: After the straddle is established with the stock at 45, there is a sudden rally in the stock and it climbs quickly to 52. The call might be selling for 9 points, even though

it is 7 points in-the-money. This is not unusual in a bullish situation. Moreover, the put might be worth 1.50 points. This is also not unusual, as out-of-the-money puts with a large amount of time remaining tend to hold time value premium very well. Thus, the straddle writer would have to pay 10½ points to buy back this straddle, even though it is at the break-even point, 7 points in-the-money on the call side.

This example is included merely to demonstrate that *it is a misconception to believe that one can always buy the straddle back at the break-even point and hold his losses to mere fractions of a point by doing so.* This type of buy-back strategy works best when there is little time remaining in the straddle. In that case, the options will indeed be close to parity and the straddle will be able to be bought back for close to its initial value when the stock reaches the break-even point.

Another follow-up strategy that can be employed, similar to the previous one but with certain improvements, is to *buy back only the in-the-money option when it reaches a price equal to that of the initial straddle price.*

Example: Again using the same situation, suppose that when XYZ began to climb heavily, the call was worth 7 points when the stock reached 50. The in-the-money option—the call—is now worth an amount equal to the initial straddle value. It could then be bought back, leaving the out-of-the-money put naked. As long as the stock then remained above 45, the put would expire worthless. In practice, the put could be bought back for a small fraction after enough time had passed or if the underlying stock continued to climb in price.

This type of follow-up action does not depend on taking action at a fixed stock price, but rather is triggered by the option price itself. It is therefore a *dynamic* sort of follow-up action, one in which the same action could be applied at various stock prices, depending on the amount of time remaining until expiration. One of the problems with closing the straddle at the break-even points is that the break-even point is only a valid break-even point at expiration. A long time before expiration, this stock price will not represent much of a break-even point, as was pointed out in the last example. Thus, buying back only the in-the-money option at a fixed price may often be a superior strategy. The drawback is that one does not release much collateral by buying back the in-the-money option, and he is therefore stuck in a position with little potential profit for what could amount to a considerable length of time. The collateral released amounts to the in-the-money amount; the writer still needs to collateralize 20% of the stock price.

One could adjust this follow-up method to attempt to retain some profit. For example, he might decide to buy the in-the-money option when it has reached a value that is 1 point less than the total straddle value initially taken in. This would then allow him the

chance to make a 1-point profit overall, if the other option expired worthless. In any case, there is always the risk that the stock would suddenly reverse direction and cause a loss on the remaining option as well. This method of follow-up action is akin to the ratio writing follow-up strategy of using buy and sell stops on the underlying stock.

Before describing other types of follow-up action that are designed to combat the problems described above, it might be worthwhile to address the method used in ratio writing—rolling up or rolling down. *In straddle writing, there is often little to be gained from rolling up or rolling down.* This is a much more viable strategy in ratio writing; one does not want to be constantly moving in and out of stock positions, because of the commissions involved. However, with straddle writing, once one position is closed, there is no need to pursue a similar straddle in that same stock. It may be more desirable to look elsewhere for a new straddle position.

There are two other very simple forms of follow-up action that one might consider using, although neither one is for most strategists. *First, one might consider doing nothing at all*, even if the underlying stock moves by a great deal, figuring that the advantage lies in the probability that the stock will be back near the striking price by the time the options expire. This action should be used only by the most diversified and well-heeled investors, for in extreme market periods, almost all stocks may move in unison, generating tremendous losses for anyone who does not take some sort of action. *A more aggressive type of follow-up action would be to attempt to "leg out" of the straddle*, by buying in the profitable side and then hoping for a stock price reversal in order to buy back the remaining side. In the example above, when XYZ ran up to 52, an aggressive trader would buy in the put at 1.50, taking his profit, and then hope for the stock to fall back in order to buy the call in cheaper. This is a very aggressive type of follow-up action, because the stock could easily continue to rise in price, thereby generating larger losses. This is a trader's sort of action, not that of a disciplined strategist, and it should be avoided.

In essence, follow-up action should be designed to do two things: First, to limit the risk in the position, and second, to still allow room for a potential profit to be made. None of the above types of follow-up action accomplish both of these purposes. There is, however, a follow-up strategy that does allow the straddle writer to limit his losses while still allowing for a potential profit.

Example: After the straddle was originally sold for 7 points when the stock was at 45, the stock experiences a rally and the following prices exist:

XYZ common, 50;
XYZ January 45 call, 7;
XYZ January 45 put, 1; and
XYZ January 50 call, 3.

The January 50 call price is included because it will be part of the follow-up strategy. Notice that this straddle has a considerable amount of time value premium remaining in it, and thus would be rather expensive to buy back at the current time. Suppose, however, that the straddle writer does not touch the January 45 straddle that he is short, but instead buys the January 50 call for protection to the upside. Since this call costs 3 points, he will now have a position with a total credit of 4 points. (The straddle was originally sold for 7 points credit and he is now spending 3 points for the call at 50.) This action of buying a call at a higher strike than the striking price of the straddle has limited the potential loss to the upside, no matter how far the stock might run up. If XYZ is anywhere above 50 at expiration, the put will expire worthless and the writer will have to pay 5 points to close the call spread—short January 45, long January 50. This means that his maximum potential loss is 1 point plus commissions if XYZ is anywhere above 50 at expiration.

In addition to being able to limit the upside loss, this type of follow-up action still allows room for potential profits. If XYZ is anywhere between 41 and 49 at expiration—that is, less than 4 points away from the striking price of 45—the writer will be able to buy the straddle back for less than 4 points, thereby making a profit.

Thus, the straddle writer has both limited his potential losses to the upside and also allowed room for profit potential should the underlying stock fall back in price toward the original striking price of 45. Only severe price reversal, with the stock falling back below 40, would cause a large loss to be taken. In fact, by the time the stock could reverse its current strong upward momentum and fall all the way back to 40, a significant amount of time should have passed, thereby allowing the writer to purchase the straddle back with only a relatively small amount of time premium left in it.

This follow-up strategy has an effect on the margin requirement of the position. When the calls are bought as protection to the upside, the writer has, for margin purposes, a bearish spread in the calls and an uncovered put. The margin for this position would normally be less than that required for the straddle that is 5 points in-the-money.

A secondary move is available in this strategy.

Example: The stock continues to climb over the short term and the out-of-the-money put drops to a price of less than 50 cents. The straddle writer might now consider buying back the put, thereby leaving himself with a bear spread in the calls. His net credit left in the position, after buying back the put at .50, would be 3.50 points. Thus, if XYZ should reverse direction and be within 3.50 points of the striking price—that is, anywhere below 48.50—at expiration, the position will produce a profit. In fact, if XYZ should be below 45 at expiration, the entire bear spread will expire worthless and the strategist will have made a 3.50-point profit. Finally, this repurchase of the put releases the margin requirement for the naked put, and will generally free up excess funds so that a new straddle position can be established in another stock while the low-requirement bear spread remains in place.

In summary, this type of follow-up action is broader in purpose than any of the simpler buy-back strategies described earlier. It will limit the writer's loss, but not prevent him from making a profit. Moreover, he may be able to release enough margin to be able to establish a new position in another stock by buying in the uncovered puts at a fractional price. This would prevent him from tying up his money completely while waiting for the original straddle to reach its expiration date. The same type of strategy also works in a downward market. If the stock falls after the straddle is written, one can buy the put at the next lower strike to limit the downside risk, while still allowing for profit potential if the stock rises back to the striking price.

EQUIVALENT STOCK POSITION FOLLOW-UP

Since there are so many follow-up strategies that can be used with the short straddle, the one method that summarizes the situation best is again the equivalent stock position (ESP). Recall that the ESP of an option position is the multiple of the quantity times the delta times the shares per option. The quantity is a negative number if it is referring to a short position. Using the above scenario, an example of the ESP method follows:

Example: As before, assume that the straddle was originally sold for 7 points, but the stock rallied. The following prices and deltas exist:

XYZ common, 50;
XYZ Jan 45 call, 7; delta, .90;
XYZ Jan 45 put, 1; delta, –.10; and
XYZ Jan 50 call, 3; delta, .60.

Assume that 8 straddles were sold initially and that each option is for 100 shares of XYZ. The ESP of these 8 short straddles can then be computed:

Option	Position	Delta	ESP
Jan 45 call	short 8	0.90	short 720 (–8 × .9 × 100)
Jan 45 put	short 8	–0.10	long 80 (–8 × –.1 × 100)
Total ESP			short 640 shares

Obviously, the position is quite short. Unless the trader were extremely bearish on XYZ, he should make an adjustment. The simplest adjustment would be to buy 600 shares

of XYZ. Another possibility would be to buy back 7 of the short January 45 calls. Such a purchase would add a delta long of 630 shares to the position ($7 \times .9 \times 100$). This would leave the position essentially neutral. As pointed out in the previous example, however, the strategist may not want to buy that option. If, instead, he decided to try to buy the January 50 call to hedge the short straddle, he would have to buy 10 of those to make the position neutral. He would buy that many because the delta of that January 50 is 0.60; a purchase of 10 would add a delta long of 600 shares to the position.

Even though the purchase of 10 is theoretically correct, since one is only short 8 straddles, he would probably buy only 8 January 50 calls as a practical matter.

STARTING OUT WITH THE PROTECTION IN PLACE

In certain cases, the straddle writer may be able to initially establish a position that has no risk in one direction: He can buy an out-of-the-money put or call at the same time the straddle is written. This accomplishes the same purposes as the follow-up action described in the last few paragraphs, but the protective option will cost less since it is out-of-the-money when it is purchased. There are, of course, both positive and negative aspects involved in adding an out-of-the-money long option to the straddle write at the outset.

Example: Given the following prices:

XYZ, 45;
XYZ January 45 straddle, 7; and
XYZ January 50 call, 1.50,

the upside risk will be limited. If one writes the January 45 straddle for 7 points and buys the January 50 call for 1.50 points, his overall credit will be 5.50 points. He has no upside risk in this position, for if XYZ should rise and be over 50 at expiration, he will be able to close the position by buying back the call spread for 5 points. The put will expire worthless. The out-of-the-money call has eliminated any risk above 50 on the position. Another advantage of buying the protection initially is that one is protected if the stock should experience a gap opening or a trading halt. If he already owns the protection, such stock price movement in the direction of the protection is of little consequence. However, if he was planning to buy the protection as a follow-up action, the sudden surge in the stock price may ruin his strategy.

The overall profit potential of this position is smaller than that of the normal straddle write, since the premium paid for the long call will be lost if the stock is below 50 at

expiration. However, the automatic risk-limiting feature of the long call may prove to be worth more than the decrease in profit potential. The strategist has peace of mind in a rally and does not have to worry about unlimited losses accruing to the upside.

Downside protection for a straddle writer can be achieved in a similar manner by buying an out-of-the-money put at the outset.

Example: With XYZ at 45, one might write the January 45 straddle for 7 and buy a January 40 put for 1 point if he is concerned about the stock dropping in price.

It should now be fairly easy to see that the straddle writer could limit risk in either direction by initially buying both an out-of-the-money call and an out-of-the-money put at the same time that the straddle is written. The major benefit in doing this is that risk is limited in either direction. Moreover, the margin requirements are significantly reduced, since the whole position consists of a call spread and a put spread. There are no longer any naked options. The detriment of buying protection on both sides initially is that commission costs increase and the overall profit potential of the straddle write is reduced, perhaps significantly, by the cost of two long options. Therefore, one must evaluate whether the cost of the protection is too large in comparison to what is received for the straddle write. This completely protected strategy can be very attractive when available, and it is described again in Chapter 23, Spreads Combining Calls and Puts.

In summary, any strategy in which the straddle writer also decides to buy protection presents both advantages and disadvantages. Obviously, the risk-limiting feature of the purchased options is an advantage. However, the seller of options does not like to purchase pure time value premium as protection at any time. He would generally prefer to buy intrinsic value. The reader will note that, in each of the protective buying strategies discussed above, the purchased option has a large amount of time value premium left in it. Therefore, the writer must often try to strike a delicate balance between trying to limit his risk on one hand and trying to hold down the expenses of buying long options on the other hand. In the final analysis, however, the risk must be limited regardless of the cost.

STRANGLE (COMBINATION) WRITING

Recall that a strangle is any position involving both puts and calls, when there is some difference in the terms of the options. Commonly, the puts and calls will have the same expiration date but differing striking prices. *A strangle write is usually established by selling both an out-of-the-money put and an out-of-the-money call with the stock approximately centered between the two striking prices.* In this way, the naked option

writer can remain neutral on the outlook for the underlying stock, even when the stock is not near a striking price.

This strategy is quite similar to straddle writing, except that *the strangle writer makes his maximum profit over a much wider range than the straddle writer does.* In this or any other naked writing strategy, the most money that the strategist can make is the amount of the premium received. The straddle writer has only a minute chance of making a profit of the entire straddle premium, since the stock would have to be exactly at the striking price at expiration in order for both the written put and call to expire worthless. The strangle writer will make his maximum profit potential if the stock is anywhere between the two strikes at expiration, because both options will expire worthless in that case. This strategy is equivalent to the variable ratio write described previously in Chapter 6 on ratio call writing.

Example: Given the following prices:

XYZ common, 65;
XYZ January 70 call, 4; and
XYZ January 60 put, 3,

a strangle write would be established by selling the January 70 call and the January 60 put. If XYZ is anywhere between 60 and 70 at January expiration, both options will expire worthless and the strangle writer will make a profit of 7 points, the amount of the original credit taken in. If XYZ is above 70 at expiration, the strategist will have to pay something to buy back the call. For example, if XYZ is at 77 at expiration, the January 70 call will have to be bought back for 7 points, thereby creating a break-even situation. To the downside, if XYZ were at 53 at expiration, the January 60 put would have to be bought back for 7 points, thereby defining that as the downside break-even point. Table 20-3 and Figure 20-3 outline the potential results of this strangle write. The profit range in this example is quite wide, extending from 53 on the downside to 77 on the upside. With the stock presently at 65, this is a relatively neutral position.

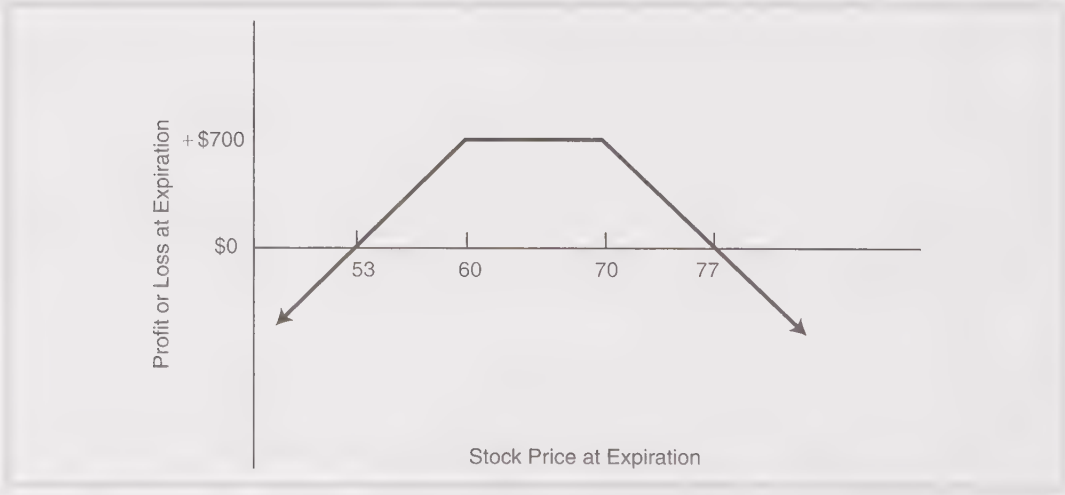
At first glance, this may seem to be a more conservative strategy than straddle writing, because the profit range is wider and the stock needs to move a great deal to reach the break-even points. In the absence of follow-up action, this is a true observation. However, if the stock begins to rise quickly or to drop dramatically, the strangle writer often has little recourse but to buy back the in-the-money option in order to limit his losses. This can, as has been shown previously, entail a purchase price involving excess amounts of time value premium, thereby generating a significant loss.

The only other alternative that is available to the strangle writer (outside of attempting to trade out of the position) is to convert the position into a straddle if the stock reaches either break-even point.

TABLE 20-3.
Results of a combination write.

Stock Price at Expiration	Call Profit	Put Profit	Total Profit
40	+$ 400	–$1,700	–$1,300
50	+ 400	– 700	– 300
53	+ 400	– 400	0
57	+ 400	0	+ 400
60	+ 400	+ 300	+ 700
65	+ 400	+ 300	+ 700
70	+ 400	+ 300	+ 700
73	+ 100	+ 300	+ 400
77	– 300	+ 300	0
80	– 600	+ 300	– 300
90	– 1,600	+ 300	– 1,300

FIGURE 20-3.
Sale of a combination.



Example: If XYZ rose to 70 or 71 in the previous example, the January 70 put would be sold. Depending on the amount of collateral available, the January 60 put may or may not be bought back when the January 70 put is sold. This action of converting the strangle write into a straddle write will work out well if the stock stabilizes. It will also lessen the

pain if the stock continues to rise. However, if the stock reverses direction, the January 70 put write will prove to be unprofitable. Technical analysis of the underlying stock may prove to be of some help in deciding whether or not to convert the strangle write into a straddle. If there appears to be a relatively large chance that the stock could fall back in price, it is probably not worthwhile to roll the put up.

This example of a strangle write is one in which the writer received a large amount of premium for selling the put and the call. Many times, however, an aggressive strangle writer is tempted to sell two out-of-the-money options that have only a short life remaining. These options would generally be sold at fractional prices. This can be an extremely aggressive strategy at times, for if the underlying stock should move quickly in either direction through a striking price, there is little the strangle writer can do. He must buy in the options to limit his loss. Nevertheless, this type of strangle writing—selling short-term, fractionally priced, out-of-the-money options—appeals to many writers. This is a similar philosophy to that of the naked call writer described in Chapter 5, who writes calls that are nearly restricted, figuring there will be a large probability that the option will expire worthless. It also has the same risk: A large price change or gap opening can cause such devastating losses that many profitable trades are wiped away. Selling fractionally priced combinations is a poor strategy and should be avoided.

Before leaving the topic of strangle writing, it may be useful to determine how the margin requirements apply to a strangle write. Recall that the margin requirements for writing a straddle is 20% of the stock price plus the price of either the put or the call, whichever is in-the-money. In a strangle write, however, both options may be out-of-the-money, as in the example above. When this is the case, the straddle writer is allowed to deduct the smaller out-of-the-money amount from his requirement. Thus, if XYZ were at 68 and the January 60 put and the January 70 call had been written, the collateral requirement would be 20% of the stock price, plus the call premium, less $200—the lesser out-of-the-money amount. The call is 2 points out-of-the-money and the put is 8 points out-of-the-money. Actually, the true collateral requirement for any write involving both puts and calls—straddle write or strangle write—is *the greater of the requirement on the put or the call, plus the amount by which the other option is in-the-money.* The last phrase, the amount by which the other option is in-the-money, applies to a situation in which a strangle had been constructed by selling two in-the-money options. This is a less popular strategy, since the writer generally receives less time value premium by writing two in-the-money options. An example of an in-the-money strangle is to sell the January 60 call and the January 70 put with the stock at 65.

FURTHER COMMENTS ON UNCOVERED STRADDLE AND STRANGLE WRITING

When ratio writing was discussed, it was noted that it was a strategy with a high probability of making a limited profit. Since the straddle write is equivalent to the ratio write and the strangle write is equivalent to the variable ratio write, the same statement applies to these strategies. The practitioner of straddle and strangle writing must realize, however, that protective follow-up action is mandatory in limiting losses in a very volatile market. There are other techniques that the straddle writer can sometimes use to help reduce his risk.

It has often been mentioned that puts lose their time value premium more quickly when they become in-the-money options than calls do. *One can often construct a neutral position by writing an extra put or two.* That is, if one sells 5 or 6 puts and 4 calls with the same terms, he may often have created a more neutral position than a straddle write. If the stock moves up and the call picks up time premium in a bullish market, the extra puts will help to offset the negative effect of the calls. On the other hand, if the stock drops, the 5 or 6 puts will not hold as much time premium as the 4 calls are losing—again a neutral, standoff position. If the stock begins to drop too much, the writer can always balance out the position by selling another call or two. The advantage of writing an extra put or two is that it counterbalances the straddle writer's most severe enemy: a quick, extremely bullish rise by the underlying stock.

USING THE DELTAS

This analysis, that adding an extra short put creates a neutral position, can be substantiated more rigorously. Recall that a ratio writer or ratio spreader can use the deltas of the options involved in his position to determine a neutral ratio. The straddle writer can do the same thing, of course. It was stated that the difference between a call's delta and a put's delta is approximately one. Using the same prices as in the previous straddle writing example, and assuming the call's delta to be .60, a neutral ratio can be determined.

	Prices		Deltas
	XYZ common:	45	
	XYZ January 45 call:	4	.60
	XYZ January 45 put:	3	–.40 (.60 – 1)

The put has a negative delta, to indicate that the put and the underlying stock are inversely related. A neutral ratio is determined by dividing the call's delta by the put's delta and

ignoring the minus sign. The resultant ratio—1.5:1 (.60/.40) in this case—is the ratio of puts to sell for each call that is sold. Thus, one should sell 3 puts and sell 2 calls to establish a neutral position. The reader may wonder if the assumption that an at-the-money call has a delta of .60 is a fair one. It generally is, although very long-term calls will have higher at-the-money deltas, and very short-term calls will have deltas near .50. Consequently, a 3:2 ratio is often a neutral one. When neutral ratios were discussed with respect to ratio writing, it was mentioned that selling 5 calls and buying 300 shares of stock often results in neutral ratio. The reader should note that a straddle constructed by selling 3 puts and 2 calls is equivalent to the ratio write in which one sells 5 calls and buys 300 shares of stock.

If a straddle writer is going to use the deltas to determine his neutral ratio, he should compute each one at the time of his initial investment, of course, rather than relying on a generality such as that 3 puts and 2 calls often result in a neutral position. The deltas can be used as a follow-up action, by adjusting the ratio to remain neutral after a move by the underlying stock.

AVOID EXCESS TRADING

In any of the straddle and strangle writing strategies described above, too much follow-up action can be detrimental because of the commission costs involved. Thus, although it is important to take protective action, the straddle writer should plan in advance to make the minimum number of strategic moves to protect himself. That is why buying protection is often useful; not only does it limit the risk in the direction that the stock is moving, but it also involves only one additional option commission. In fact, if it is feasible, buying protection at the outset is often a better strategy than protecting as a secondary action.

An extension of this concept of trying to avoid too much follow-up action is that *the strategist should not attempt to anticipate movement in an underlying stock.* For example, if the straddle writer has planned to take defensive action should the stock reach 50, he should not anticipate by taking action with the stock at 48 or 49. It is possible that the stock could retreat back down; then the writer would have taken a defensive action that not only cost him commissions, but reduced his profit potential. Of course, there is a little trader in everyone, and the temptation to anticipate (or to wait too long) is always there. Unless there are very strong technical reasons for doing so, the strategist should resist the temptation to trade, and should operate his strategy according to his original plan. The ratio writer may actually have an advantage in this respect, because he can use buy and sell stops on the underlying stock to remove the emotion from his follow-up strategy. This technique was described in Chapter 6 on ratio call writing. Unfortunately, no such emotionless technique exists for the straddle or strangle writer.

USING THE CREDITS

In previous chapters, it was mentioned that the sale of uncovered options does not require any cash investment on the part of the strategist. He may use the collateral value of his present portfolio to finance the sale of naked options. Moreover, once he sells the uncovered options, he can take the premium dollars that he has brought in from the sales to buy fixed-income securities, such as Treasury bills. The same statements naturally apply to the straddle writing and strangle writing strategies. However, the strategist should not be overly obsessed with continuing to maintain a credit balance in his positions, nor should he strive to hold onto the Treasury bills at all costs. If one's follow-up actions dictate that he must take a debit to avoid losses or that he should sell out his Treasury bills to keep a credit, he should by all means do so.

CHAPTER 21

Synthetic Stock Positions Created by Puts and Calls

It is possible for a strategist to establish a position that is essentially the same as a stock position, and he can do this using only options. The option position generally requires a smaller margin investment and may have other residual benefits over simply buying stock or selling stock short. In brief, the strategies are summarized by:

1. Buy call and sell put instead of buying stock.
2. Buy put and sell call instead of selling stock short.

SYNTHETIC LONG STOCK

When one buys a call and sells a put at the same strike, he sets up a position that is equivalent to owning the stock. His position is sometimes called "synthetic" long stock.

Example: To verify that this option position acts much like a long stock position would, suppose that the following prices exist:

XYZ common, 50;
XYZ January 50 call, 5; and
XYZ January 50 put, 4.

If one were bullish on XYZ and wanted to buy stock at 50, he might consider the alternative strategy of buying the January 50 call and selling (uncovered) the January 50 put. By using the option strategy, the investor has nearly the same profit and loss potential as the stock buyer, as shown in Table 21-1. The two right-hand columns of the table compare the results of the option strategy with the results that would be obtained by merely owning the stock at 50.

The table shows that the result of the option strategy is exactly $100 less than the stock results for any price at expiration. Thus, the "synthetic" long stock and the actual long stock have nearly the same profit and loss potentials. The reason there is a difference in the results of the two equivalent positions lies in the fact that the option strategist had to pay 1 point of time premium in order to set up his position. That $100 represents the carrying cost of the stock and the dividends to be paid, so in effect, this is exactly the same as owning stock from that point of view (the complete relationship between stock ownership and "synthetic stock" is explained as conversion arbitrage in Chapter 27). This time premium represents the $100 by which the "synthetic" position underperforms the actual stock position at expiration. Note that, with XYZ at 50, both the put and the call are completely composed of time value premium initially. The synthetic position consists of paying out 5 points of time premium for the call and receiving in 4 points of time premium for the put. The net time premium is thus a 1-point payout.

The reason one would consider using the synthetic long stock position rather than the stock position itself is that the synthetic position may require a much smaller investment than buying the stock would require. The purchase of the stock requires $5,000 in a cash account or $2,500 in a margin account (if the margin rate is 50%). However, the synthetic position requires only a $100 debit plus a collateral requirement—20% of the stock price, plus the put premium, minus the difference between the striking price and the stock price. The balance, invested in short-term funds, would earn enough money,

TABLE 21-1.
Synthetic long stock position.

XYZ Price at Expiration	January 50 Call Result	January 50 Put Result	Total Option Result	Long Stock Result
40	–$500	–$600	–$1,100	–$1,000
45	– 500	– 100	– 600	– 500
50	– 500	+ 400	– 100	0
55	0	+ 400	+ 400	+ 500
60	+ 500	+ 400	+ 900	+ 1,000

theoretically, to offset the $100 paid for the synthetic position. In this example, the collateral requirement would be 20% of $5,000, or $1,000, plus the $400 put premium, plus the $100 debit incurred by paying 5 for the call and only receiving 4 for the put. This is a total of $1,500 initially. There is no initial difference between the stock price and the striking price. Of course, this collateral requirement would increase if the stock fell in price, and would decrease if the stock rose in price, since there is a naked put. Also notice that buying stock creates a $5,000 debit in the account, whereas the option strategy's debit is $100; the rest is a collateral requirement, not a cash requirement.

The effect of this reduction in margin required is that some leverage is obtained in the position. If XYZ rose to 60, the stock position profit would be $1,000 for a return of 40% on margin ($1,000/$2,500). With the option strategy, the percentage return would be higher. The profit would be $900 and the return thus 60% ($900/$1,500). Of course, leverage works to the downside as well, so that the percent risk is also greater in the option strategy.

The synthetic stock strategy is generally not applied merely as an alternative to buying stock. Besides possibly having a smaller profit potential, *the option strategist does not collect dividends, whereas the stock owner does.* However, the strategist is able to earn interest on the funds that he did not spend for stock ownership. It is important for the strategist to understand that a long call plus a short put is equivalent to long stock. It thus may be possible for the strategist to substitute the synthetic option position in certain option strategies that normally call for the purchase of stock.

SYNTHETIC SHORT SALE

A position that is equivalent to the short sale of the underlying stock can be established by selling a call and simultaneously buying a put. This alternative option strategy, in general, offers significant benefits when compared with selling the stock short. Using the prices above—XYZ at 50, January 50 call at 5, and January 50 put at 4—Table 21-2 depicts the potential profits and losses at January expiration.

Both the option position and the short stock position have similar results: large potential profits if the stock declines and unlimited losses if the underlying stock rises in price. However, the option strategy does better than the stock position, because the option strategist is getting the benefit of the time value premium. Again, this is because the call has more time value premium than the put, which works to the option strategist's advantage in this case, when he is selling the call and buying the put.

Two important factors make the option strategy preferable to the short sale of stock: (1) There is no need to borrow stock, and (2) there is no need for an uptick. When one sells stock short, he must first borrow the stock from someone who owns it. This procedure

TABLE 21-2.
Synthetic short sale position.

XYZ Price at Expiration	January 50 Call Result	January 50 Put Result	Total Option Result	Short Stock Result
40	+$500	+$600	+$1,100	+$1,000
45	+ 500	+ 100	+ 600	+ 500
50	+ 500	– 400	+ 100	0
55	0	– 400	– 400	– 500
60	– 500	– 400	– 900	– 1,000

is handled by one's brokerage firm's stock loan department. If, for some reason, no one who owns the stock wants to loan it out, then a short sale cannot be executed. In addition, both the NYSE and NASDAQ require that a stock being sold short must be sold on an uptick. That is, the price of the short sale must be higher than the previous sale. This rule was introduced (for the NYSE) years ago in order to prevent traders from slamming the market down in a "bear raid."

With the *option* "synthetic short sale" strategy, however, one does not have to worry about either of these factors. First, calls can be sold short at will; there is no need to borrow anything. Also, calls can be sold short (and puts bought) even though the underlying stock might be trading on a minus tick (a downtick). Many professional traders use the "synthetic short sale" strategy because it allows them to get equivalently short the stock in a very timely manner. If one wants to short stock, and if he has not previously arranged to borrow it, then some time is wasted while one's broker checks with the stock loan department in order to make sure that the stock can indeed be borrowed.

There is a caveat, however. If one sells calls on a stock that cannot be borrowed, then he must be sure to avoid assignment. For if one is assigned a call, then he too will be short the stock. If the stock cannot be borrowed, the broker will buy him in. Thus, in situations in which the stock might be difficult to borrow, one should use a striking price such that the call is out-of-the-money when sold initially. This will decrease, but not eliminate, the possibility of early assignment.

Leverage is a factor in this strategy also. The short seller would need $2,500 to collateralize this position, assuming that the margin rate is 50%. The option strategist initially only needs 20% of the stock price, plus the call price, less the credit received, for a $1,400 requirement. Moreover, one of the major disadvantages that was mentioned with the synthetic long stock position is not a disadvantage in the synthetic short sale

strategy: The option trader does not have to pay out dividents on the options, but the short seller of stock must.

Because of the advantages of the option position in not having to pay out the dividend and also having a slightly larger profit potential from the excess time value premium, it may often be feasible for the trader who is looking to sell stock short to instead sell a call and buy a put. It is also important for the strategist to understand the equivalence between the short stock position and the option position. He might be able to substitute the option position in certain cases when the short sale of stock is normally called for.

SPLITTING THE STRIKES

The strategist may be able to use a slight variation of the synthetic strategy to set up an aggressive, but attractive, position. Rather than using the same striking price for the put and call, he can use a lower striking price for the put and a higher striking price for the call. This action of splitting apart the striking prices gives him some room for error, while still retaining the potential for large profits.

BULLISHLY ORIENTED

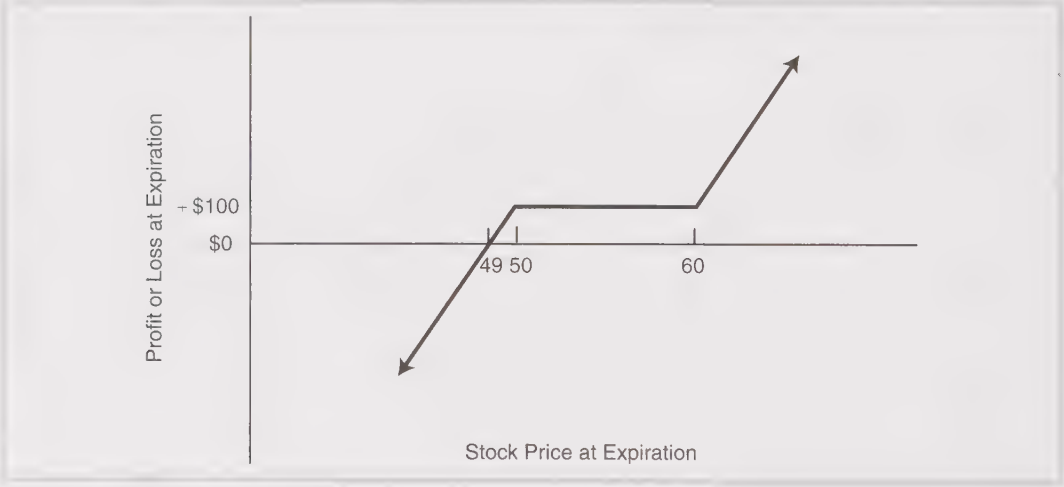
If an out-of-the-money put is sold naked, and an out-of-the-money call is simultaneously purchased, an aggressive bullish position is established—often for a credit. This position is sometimes called a split-strike conversion, even though it doesn't contain a position in the underlying stock. If the underlying stock rises far enough, profits can be generated on both the long call and the short put. If the stock remains relatively unchanged, the call purchase will be a loss, but the put sale will be a profit. The risk occurs if the underlying stock drops in price, producing losses on both the short put and the long call.

Example: The following prices exist: XYZ is at 53, a January 50 put is selling for 2, and a January 60 call is selling for 1. An investor who is bullish on XYZ sells the January 50 put naked and simultaneously buys the January 60 call. This position brings in a credit of 1 point, less commissions. There is a collateral requirement necessary for the naked put. If XYZ is anywhere between 50 and 60 at January expiration, both options would expire worthless, and the investor would make a small profit equal to the amount of the initial credit received. If XYZ rallies above 60 by expiration, however, his potential profits are unlimited, since he owns the call at 60. His losses could be very large if XYZ should decline well below 50 before expiration, since he has written the naked put at 50. Table 21-3 and Figure 21-1 depict the results at expiration of this strategy.

TABLE 21-3.
Bullishly split strikes.

XYZ Price at Expiration	January 50 Put Profit	January 60 Call Profit	Total Profit
40	–$800	–$100	–$900
45	– 300	– 100	– 400
50	+ 200	– 100	+ 100
55	+ 200	– 100	+ 100
60	+ 200	– 100	+ 100
65	+ 200	+ 400	+ 600
70	+ 200	+ 900	+ 1,100

FIGURE 21-1.
Bullishly split strikes.



Essentially, the investor who uses this strategy is bullish on the underlying stock and is attempting to buy an out-of-the-money call for free. If he is moderately wrong and the underlying stock rallies only slightly or even declines slightly, he can still make a small profit. If he is correct, of course, large profits could be generated in a rally. He may lose heavily if he is very wrong and the stock falls by a large amount instead of rising.

This strategy is often useful when options are overpriced. Suppose that one has a bullish opinion on the underlying stock, yet is dismayed to find that the calls are quite expensive. If he buys one of these expensive calls, he can mitigate the expensiveness

somewhat by also *selling* an out-of-the-money put, which is presumably somewhat expensive also. Thus, if he is right about the bullish attitude on the stock, he owns a call that is more "fairly priced" because its cost was reduced by the amount of the put sale.

BEARISHLY ORIENTED

There is a companion strategy for the investor who is bearish on a stock. He could attempt to buy an out-of-the-money put, giving himself the opportunity for substantial profits in a stock price decline, and could "finance" the purchase of the put by writing an out-of-the-money call naked. The sale of the call would provide profits if the stock stayed below the striking price of the call, but could cost him heavily if the underlying stock rallies too far. This strategy is also called a split-strike reversal.

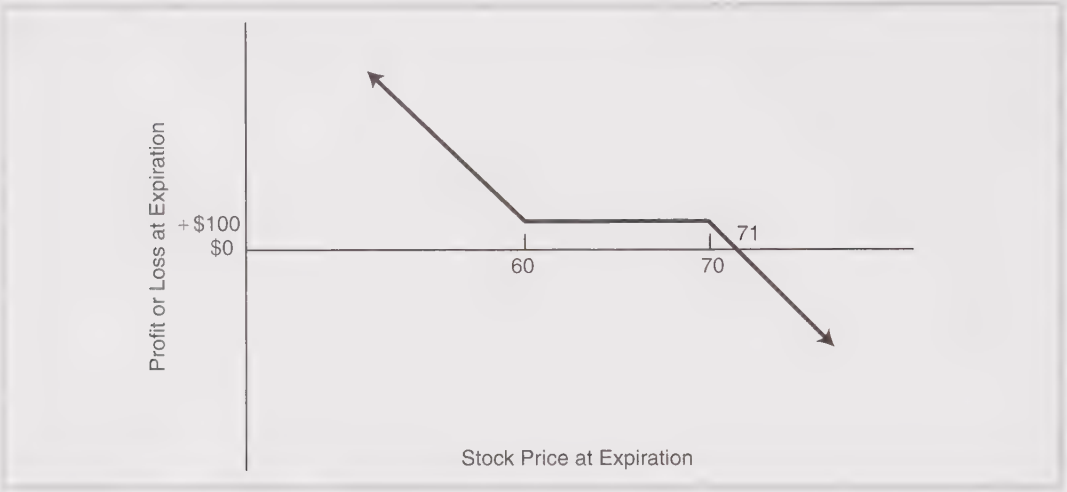
Example: With XYZ at 65, the bearish investor buys a February 60 put for 2 points, and simultaneously sells a February 70 call for 3 points. These trades bring in a credit of 1 point, less commissions. The investor must collateralize the sale of the call. If XYZ should decline substantially by February expiration, large profits are possible because the February 60 put is owned. Even if XYZ does not perform as expected, but still ends up anywhere between 60 and 70 at expiration, the profit will be equal to the initial credit because both options will expire worthless. However, if the stock rallies above 70, unlimited losses are possible because there is a naked call at 70. Table 21-4 and Figure 21-2 show the results of this strategy at expiration.

This is clearly an aggressively bearish strategy. The investor would like to own an out-of-the-money put for downside potential. In addition, he sells an out-of-the-money

TABLE 21-4.
Bearishly split strikes.

XYZ Price at Expiration	February 60 Put Profit	February 70 Call Profit	Total Profit
50	+$800	+$300	+$1,100
55	+ 300	+ 300	+ 600
60	– 200	+ 300	+ 100
65	– 200	+ 300	+ 100
70	– 200	+ 300	+ 100
75	– 200	– 200	– 400
80	– 200	– 700	– 900

FIGURE 21-2.
Bearishly split strikes.



call, normally for a price greater than that of the purchased put. The call sale essentially lets him own the put for free. In fact, he can still make profits even if the underlying stock rises slightly or only falls slightly. His risk is realized if the stock rises above the striking price of the written call.

This strategy of splitting the strikes in a bearish manner is used very frequently in conjunction with the ownership of common stock. That is, a stock owner who is looking to protect his stock will buy an out-of-the-money put and sell an out-of-the-money call to finance the put purchase. This strategy is called a "protective collar" and was discussed in more detail in the chapter on Put Buying in Conjunction with Common Stock Ownership. A strategy that is similar to these, but modifies the risk, is presented in Chapter 23, Spreads Combining Calls and Puts.

SUMMARY

In either of these aggressive strategies, *the investor must have a definite opinion about the future price movement of the underlying stock.* He buys an out-of-the-money option to provide profit potential for that stock movement. However, an investor can lose the entire purchase proceeds of an out-of-the-money option if the stock does not perform as expected. An aggressive investor, who has sufficient collateral, might attempt to counteract this effect by also writing an out-of-the-money option to cover the cost of the option that he bought. Then, he will not only make money if the stock performs as expected, but

he will also make money if the stock remains relatively unchanged. He will lose quite heavily, however, if the underlying stock goes in the opposite direction from his original anticipation. That is why he must have a definite opinion on the stock and also be fairly certain of his timing.

CHAPTER 22

Basic Put Spreads

Put spreading strategies do not differ substantially in theory from their accompanying call spread strategies. Both bullish and bearish positions can be constructed with put spreads, as was also the case with call spreads. However, because puts are more oriented toward downward stock movement than calls are, some bearish put spread strategies are superior to their equivalent bearish call spread strategies.

The three simplest forms of option spreads are:

1. the bull spread,
2. the bear spread, and
3. the calendar spread.

The same types of spreads that were constructed with calls can be established with puts, but there are some differences.

BEAR SPREAD

In a call bear spread, a call with a lower striking price was sold while a call at a higher striking price was bought. Similarly, *a put bear spread is established by selling a put at a lower strike while buying a put at a higher strike.* The put bear spread is a debit spread. This is true because a put with a higher striking price will sell for more than a put with a lower striking price. Thus, on a stock with both puts and calls trading, one could set up a bear spread for a credit (using calls) or alternatively set one up for a debit (using puts):

Put Bear Spread	Call Bear Spread
Buy XYZ January 60 put	Buy XYZ January 60 call
Sell XYZ January 50 put	Sell XYZ January 50 call
(debit spread)	(credit spread)

The put bear spread has the same sort of profit potential as the call bear spread. There is a limited maximum potential profit, and this profit would be realized if XYZ were below the lower striking price at expiration. The put spread would widen, in this case, to equal the difference between the striking prices. The maximum risk is also limited, and would be realized if XYZ were anywhere above the higher striking price at expiration.

Example: The following prices exist:

XYZ common, 55;
XYZ January 50 put, 2; and
XYZ January 60 put, 7.

Buying the January 60 put and selling the January 50 would establish a bear spread for a 5-point debit. Table 22-1 will help verify that this is indeed a bearish position. The reader will note that Figure 22-1 has the same shape as the call bear spread's graph (Figure 8-1). The investment required for this spread is the net debit, and it must be paid in full. Notice that *the maximum profit potential is realized anywhere below 50 at expiration, and the maximum risk potential is realized anywhere above 60 at expiration.* The maximum risk is always equal to the initial debit required to establish the spread plus commissions. The break-even point is 55 in this example. The following formulae allow one to quickly compute the meaningful statistics regarding a put bear spread.

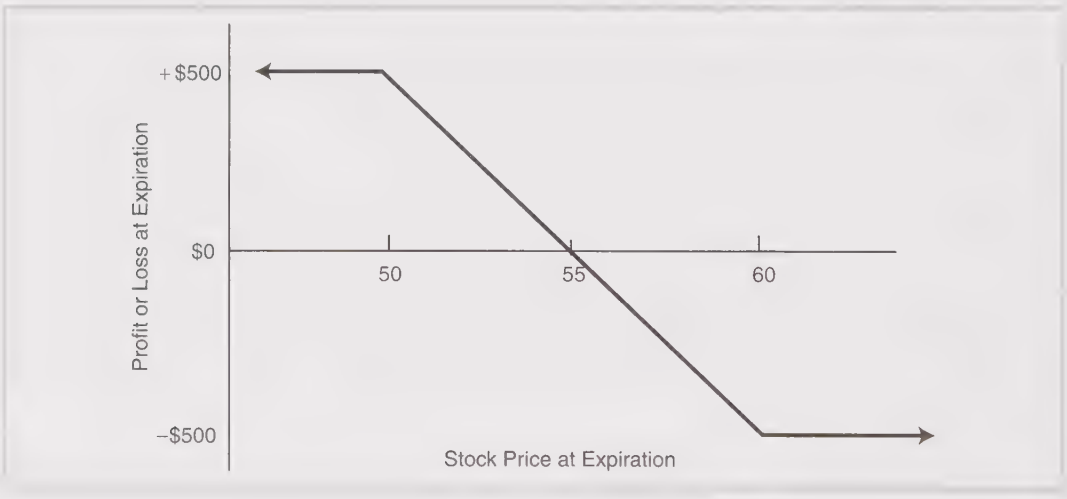
Maximum risk = Initial debit
Maximum profit = Difference between strikes – Initial debit
Break-even price = Higher striking price – Initial debit

Put bear spreads have an advantage over call bear spreads. With puts, one is selling an out-of-the-money options when setting up the spread. Thus, *one is not risking early exercise of his written option before the spread becomes profitable.* For the written put to be in-the-money, and thus in danger of being exercised, the spread would have to be profitable, because the stock would have to be below the lower striking price. Such is not the case with call bear spreads. In the call spread, one sells an in-the-money call as part

TABLE 22-1.
Put bear spread.

XYZ Price at Expiration	January 50 Put Profit	January 60 Put Profit	Total Profit
40	–$800	+$1,300	+$500
45	– 300	+ 800	+ 500
50	+ 200	+ 300	+ 500
55	+ 200	– 200	0
60	+ 200	– 700	– 500
70	+ 200	– 700	– 500
80	+ 200	– 700	– 500

FIGURE 22-1.
Put bear spread.



of the bear spread, and thus could be at risk of early exercise before the spread has a chance to become profitable.

Beside this difference in the probability of early exercise, the put bear spread holds another advantage over the call bear spread. *In the put spread, if the underlying stock drops quickly, thereby making both options in-the-money, the spread will normally widen quickly as well.* This is because, as has been mentioned previously, put options tend to lose time value premium rather quickly when they go into-the-money. In the example above, if XYZ rapidly dropped to 48, the January 60 put would be near 12, retaining very little time

premium. However, the January 50 put that is short would also not retain much time value premium, perhaps selling at 4 points or so. Thus, the spread would have widened to 8 points. Call bear spreads often do not produce a similar result on a short-term downward movement. Since the call spread involves being short a call with a lower striking price, this call may actually pick up time value premium as the stock falls close to the lower strike. Thus, even though the call spread might have a similar profit at expiration, it often will not perform as well on a quick downward movement.

For these two reasons—less chance of early exercise and better profits on a short-term movement—the put bear spread is superior to the call bear spread. Some investors still prefer to use the call spread, since it is established for a credit and thus does not require a cash investment. This is a rather weak reason to avoid the superior put spread and should not be an overriding consideration. Note that the margin requirement for a call bear spread will result in a reduction of one's buying power by an amount approximately equal to the debit required for a similar put bear spread. (The margin required for a call bear spread is the difference between the striking prices less the credit received from the spread.) Thus, the only accounts that gain any substantial advantage from a credit spread are those that are near the minimum equity requirement to begin with. For most brokerage firms, the minimum equity requirement for spreads is $2,000.

BULL SPREAD

A bull spread can be established with put options by buying a put at a lower striking price and simultaneously selling a put with a higher striking price. This, again, is the same way a bull spread was constructed with calls: selling the higher strike and buying the lower strike.

Example: The same prices can be used:

XYZ common, 55;
XYZ January 50 put, 2; and
XYZ January 60 put, 7.

The bull spread is constructed by buying the January 50 put and selling the January 60 put. This is a credit spread. The credit is 5 points in this example. If the underlying stock advances by January expiration and is anywhere above 60 at that time, the maximum profit potential of the spread will be realized. In that case, with XYZ anywhere above 60, both puts would expire worthless and the spreader would make a profit of the entire credit – 5 points in this example. Thus, *the maximum profit potential is limited, and the maximum profit occurs if the underlying stock rises in price above the higher strike.*

These are the same qualities that were displayed by a call bull spread (Chapter 7). The name "bull spread" is derived from the fact that this is a bullish position: The strategist wants the underlying stock to rise in price.

The risk is limited in this spread. If the underlying stock should decline by expiration, the maximum loss will be realized with XYZ anywhere below 50 at that time. The risk is 5 points in this example. To see this, note that if XYZ were anywhere below 50 at expiration, the differential between the two puts would widen to 10 points, since that is the difference between their striking prices. Thus, the spreader would have to pay 10 points to buy the spread back, or to close out the position. Since he initially took in a 5-point credit, this means his loss is equal to 5 points—the 10-point cost of closing out less the 5 points he received initially.

The investment required for a bullish put spread is actually a collateral requirement, since the spread is a credit spread. The amount of collateral required is equal to the difference between the striking prices less the net credit received for the spread. In this example, the collateral requirement is $500—the $1,000, or 10-point, differential in the striking prices less the $500 credit received from the spread. Note that *the maximum possible loss is always equal to the collateral requirement in a bullish put spread.*

It is not difficult to calculate the break-even point in a bullish spread. In this example, the break-even point before commissions is 55 at expiration. With XYZ at 55 in January, the January 50 put would expire worthless and the January 60 put would have to be bought back for 5 points. It would be 5 points in-the-money with XYZ at 55. Thus, the spreader would break even, since he originally received 5 points credit for the spread and would then pay out 5 points to close the spread. The following formulae allow one to quickly compute the details of a bullish put spread:

Maximum potential risk = Initial collateral requirement
= Difference in striking prices – Net credit received
Maximum potential profit = Net credit
Break-even price = Higher striking price – Net credit

CALENDAR SPREAD

In a calendar spread, a near-term option is sold and a longer-term option is bought, both with the same striking price. This definition applies to either a put or a call calendar spread. In Chapter 9, it was shown that there were two philosophies available for call calendar spreads, either neutral or bullish. Similarly, there are two philosophies available for put calendar spreads: neutral or bearish.

In a neutral calendar spread, one sets up the spread with the idea of closing the spread when the near-term call or put expires. In this type of spread, the maximum profit will be realized if the stock is exactly at the striking price at expiration. The spreader is merely attempting to capitalize on the fact that the time value premium disappears more rapidly from a near-term option than it does from a longer-term one.

Example: XYZ is at 50 and a January 50 put is selling for 2 points while an April 50 put is selling for 3 points. A neutral calendar spread can be established for a 1-point debit by selling the January 50 put and buying the April 50 put. The investment required for this position is the amount of the net debit, and it must be paid for in full. If XYZ is exactly at 50 at January expiration, the January 50 put will expire worthless and the April 50 put will be worth about 2 points, assuming other factors are the same. The neutral spreader would then sell the April 50 put for 2 points and take his profit. The spreader's profit in this case would be one point before commissions, because he originally paid a 1-point debit to set up the spread and then liquidates the position by selling the April 50 put for 2 points. Since commission costs can cut into available profits substantially, spreads should be established in a large enough quantity to minimize the percentage cost of commissions. This means that at least 10 spreads should be set up initially.

In any type of calendar spread, *the risk is limited to the amount of the net debit.* This maximum loss would be realized if the underlying stock moved substantially far away from the striking price by the time the near-term option expired. If this happened, both options would trade at nearly the same price and the differential would shrink to practically nothing, the worst case for the calendar spreader. For example, if the underlying stock drops substantially, say to 20, both the near-term and the long-term put would trade at nearly 30 points. On the other hand, if the underlying stock rose substantially, say to 80, both puts would trade at a very low price, say 1/16 or 1/8, and again the spread would shrink to nearly zero.

Neutral call calendar spreads are generally superior to neutral put calendar spreads. Since the amount of time value premium is usually greater in a call option (unless the underlying stock pays a large dividend), the spreader who is interested in selling time value would be better off utilizing call options.

The second philosophy of calendar spreading is a more aggressive one. *With put options, a bearish strategy can be constructed using a calendar spread.* In this case, one would establish the spread with out-of-the-money puts.

Example: With XYZ at 55, one would sell the January 50 put for 1 point and buy the April 50 put for 1.50. He would then like the underlying stock to remain above the striking price until the near-term January put expires. If this happens, he would make the 1-point

profit from the sale of that put, reducing his net cost for the April 50 put to 50 cents. Then, he would become bearish, hoping for the underlying stock to decline in price substantially before April expiration in order that he might be able to generate large profits on the April 50 put he holds.

Just as the bullish calendar spread with calls can be a relatively attractive strategy, so can the bearish calendar spread with puts. Granted, two criteria have to be fulfilled in order for the position to work to the optimum: The near-term put must expire worthless, and then the underlying stock must drop in order to generate profits on the long side. Although these conditions may not occur frequently, one profitable situation can more than make up for several losing ones. This is true because the initial debit for a bearish calendar spread is small, 50 cents in the example above. Thus, the losses will be small and the potential profits could be very large if things work out right.

The aggressive spreader must be careful not to "leg out" of his spread, since he could generate a large loss by doing so. The object of the strategy is to accept a rather large number of small losses, with the idea that the infrequent large profits will more than offset the sum of the losses. If one generates a large loss somewhere along the way, this may ruin the overall strategy. Also, if the underlying stock should fall to the striking price before the near-term put expires, the spread will normally have widened enough to produce a small profit; that profit should be taken by closing the spread at that time.

CHAPTER 23

Spreads Combining Calls and Puts

Certain types of spreads can be constructed that utilize both puts and calls. One of these strategies has been discussed before: the butterfly spread. However, other strategies exist that offer potentially large profits to the spreader. These other strategies are all variations of calendar spreads and/or straddles that involve both put and call options.

THE BUTTERFLY SPREAD

This strategy has been described previously, although its usage in Chapter 10 was restricted to constructing the spread with calls. Recall that the butterfly spread is a neutral position that has limited risk as well as limited profits. The position involves three striking prices, utilizing a bull spread between the lower two strikes and a bear spread between the higher two strikes. The maximum profit is realized at the middle strike at expiration, and the maximum loss is realized if the stock is above the higher strike or below the lower strike at expiration.

Since either a bull spread or a bear spread can be constructed with puts or calls, it should be obvious that a butterfly spread (consisting of both a bull spread and a bear spread) can be constructed in a number of ways. In fact, there are four ways in which the spread can be established. If option prices are fairly balanced—that is, the arbitrageurs are keeping prices in line—any of the four ways will have the same potential profits and

losses at expiration of the options. However, because of the ways in which puts and calls behave prior to their expiration, certain advantages or disadvantages are connected with some of the methods of establishing the butterfly spread.

Example: The following prices exist:

XYZ common: 60			
Strike:	50	60	70
Call:	12	6	2
Put:	1	5	11

The method using only the calls indicates that one would buy the 50 call, sell two 60 calls, and buy the 70 call. Thus, there would be a bull spread in the calls between the 50 and 60 strikes, and a bear spread in the calls between the 60 and 70 strikes. In a similar manner, one could establish a butterfly spread by combining either type of bull spread between the 50 and 60 strikes with any type of bear spread between the 60 and 70 strikes. Some of these spreads would be credit spreads, while others would be debit spreads. In fact, one's personal choice between two rather equivalent makeups of the butterfly spread might be decided by whether there were a credit or a debit involved.

Table 23-1 summarizes the four ways in which the butterfly spread might be constructed. In order to verify the debits and credits listed, the reader should recall that a bull spread consists of buying a lower strike and selling a higher strike, whether puts or calls are used. Similarly, bear spreads with either puts or calls consist of buying a higher strike and selling a lower strike. Note that the third choice—bull spread with puts and bear spread with calls—is a short straddle protected by buying the out-of-the-money put and call.

In each of the four spreads, the maximum potential profit at expiration is 8 points if the underlying stock is exactly at 60 at that time. The maximum possible loss in any of the four spreads is 2 points, if the stock is at or above 70 at expiration or is at or below 50 at expiration. For example, either the top line in the table, where the spread is set up only with calls; or the bottom line, where the spread is set up only with puts, has a risk equal to the debit involved—2 points. The large-debit spread (second line of table) will be able to be liquidated for a minimum of 10 points at expiration no matter where the stock is, so the risk is also 2 points. (It cost 12 points to begin with.) Finally, the credit combination (third line) has a maximum buy-back of 10 points, so it also has risk of 2 points. In addition, since the striking prices are 10 points apart, the maximum potential profit is 8 points (maximum profit = striking price differential minus maximum risk) in all the cases.

TABLE 23-1.
Butterfly spread.

Bull Spread (Buy Option at 50, . . . plus . . . Sell at 60)	Bear Spread (Buy Option at 70, Sell at 60)	Total Money
Calls (6 debit)	Calls (4 credit)	2 debit
Calls (6 debit)	Puts (6 debit)	12 debit
Puts (4 credit)	Calls (4 credit)	8 credit
Puts (4 credit)	Puts (6 debit)	2 debit

The factor that causes all these combinations to be equal in risk and reward is the arbitrageur. If put and call prices get too far out of line, the arbitrageur can take riskless action to force them back. This particular form of arbitrage, known as the box spread, is described later, in Chapter 27, Arbitrage.

Even though all four ways of constructing the butterfly spread are equal at expiration, some are superior to others for certain price movements prior to expiration. Recall that it was previously stated that bull spreads are best constructed with calls, and bear spreads are best constructed with puts. Since the butterfly spread is merely the combination of a bull spread and a bear spread, the best way to set up the butterfly spread is to use calls for the bull spread and puts for the bear spread. This combination is the one listed on the second line of Table 23-1. This strategy involves the largest debit of the four combinations and, as a result, many investors shun this approach. However, all the other combinations involve selling an in-the-money put or call at the outset, a situation that could lead to early exercise. The reader may also recall that the credit combination, listed on the third line of Table 23-1, was previously described as a protected straddle position. That is, one sells a straddle and simultaneously buys both an out-of-the-money put and an out-of-the-money call with the same expiration month, as protection for the straddle. Thus, a butterfly spread is actually the equivalent of a completely protected straddle write.

A butterfly spread is not an overly attractive strategy, although it may be useful from time to time. The strategy should not be considered unless one has low commission costs. Even then, the strategy has only limited profit potential (although it can be a large *percentage* profit if the initial debit is small). The limited risk feature is good to have in a position, but it alone cannot compensate for the less attractive features of the strategy. Essentially, the strategist is looking for the stock to move toward the middle strike at or near option expiration. If the potential profit is at least three times the maximum risk (and preferably four times) and the underlying stock appears to be in trading range, the strategy is feasible. Otherwise, it is not.

CONDOR AND IRON CONDOR SPREADS

Condor spreads are very similar to butterfly spreads, except that one uses two *different* strikes in the center of the spread. Condor spreads are constructed with all call options, or with all put options. Iron condors are essentially the same thing, except that they are a mix of puts and calls. Both have profit graphs with the same shape, so they are equivalent. In actual practice, most traders use the iron condor strategy if they desire to establish a strategy of this type, for all of the options are initially out-of-the-money, and the position is established for a credit:

Example: Assume XYZ is trading at 120. An iron condor spread might be established as follows:

Buy 1 XYZ Dec 135 call: .50
Sell 1 XYZ Dec 130 call: 1.00
Sell 1 XYZ Dec 110 put: 1.00
Buy 1 XYZ Dec 105 put: .50
Net Credit: 1.00

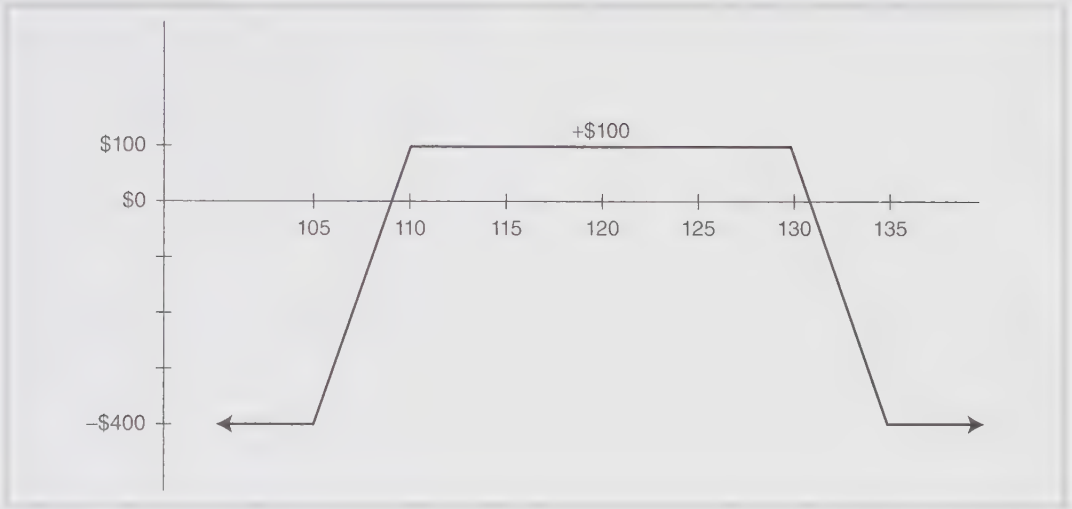
In its basic form, the difference in the call strikes and the put strikes should be the same (5 points in this example). All the options are out of the money to begin with. With these criteria, the position is always established for a credit, since the options being sold have strikes closer to the current underlying price than those being bought. If the underlying stock closes between the two middle strikes at expiration, all the options will expire worthless, and the trader will profit by the amount of the initial credit (less commissions). That is the maximum profit available from the trade: $100 in this example.

Conversely, if the underlying is outside of *either* of the long strikes at expiration, the maximum loss is realized, which would be $400 in this example. Figure 23-1 shows the profit potential for this spread:

Maximum loss = Difference In High Strikes – Initial Credit
= 135 – 130 – 1.00 = 4.00

The maximum loss is also the difference in the low strikes minus the initial credit, when the put spread and the call spread have the same differential in their strikes. If the differential in the lower strikes is greater than that for the upper strikes, the maximum loss would be the difference between the two low strikes minus the initial credit. In general, the maximum loss would be the greater of the two differences in strike prices minus the initial credit.

FIGURE 23-1.
Condor spread.



The margin required for this spread is the maximum risk. Therefore one can lose as much as 100% of his investment in this position, if the underlying is above the higher strike or below the lower strike at expiration. As a result, this strategy has great risk.

Ideally, one would set those strikes so far away from the current stock price as to make the probability of realizing that maximum loss quite small. For example, it is common to attempt to set the short strikes at one or more standard deviations from the current stock price. The actual implementation of standard deviation calculations is discussed in the chapter on mathematical applications—Chapter 28. However, the probability of loss is not zero, and there is always a possibility of realizing the maximum risk.

It should also be pointed out that an increase in volatility will harm this strategy in two ways: (1) the stock will have a greater probability of moving outside the short strikes than one had initially estimated, and (2) the options will all become more expensive, which will cause a mark-to-market loss in the spread, although many traders may not be too concerned about that since the losses are still limited.

Traders disagree on the best follow-up method. One theory holds that the call spread should be closed immediately or shortly after the stock rises above the short call strike (130 in the above example), *or* the put spread should be closed if the stock falls below the short put strike (110 in the above example). However, that method—while it may limit losses—will cause *more* losses than a more laissez-faire approach would. That is because, if the stock quickly probes above 130, say, and then falls back to 120 at expiration, one

would have already been stopped out for a "small" loss. If one had done nothing, the maximum profit would have been realized.

So the other theory of follow-up action is to let the spread run until expiration without adjusting. That theory would be ruinous, of course, if one put all of his capital in any one spread. Hence, a money management approach is required, something like this: allocate a certain portion of your entire capital to this strategy. In addition, only establish condors with one-third to one-half of the capital that one is allocating to the strategy. In that manner, if the maximum loss occurs, there is still capital left to trade with, and the same percentage limits apply to allocation of *that* capital.

In summary, the condor strategy has a great deal of popularity. There is a large chance of making a small profit (assuming that the short strikes are set sufficiently far from the initial stock price). There is also a small chance of ruin, so the trade cannot be established with a significant portion of one's capital. Overall, there are far more attractive strategies in general, especially when the stock market is volatile.

COMBINING AN OPTION PURCHASE AND A SPREAD

It is possible to combine the purchase of a call and a credit put spread to produce a position that behaves much like a call buy, although it has less risk over much of the profit range. This strategy is often used when one has a quite bullish opinion regarding the underlying security, yet the call one wishes to purchase is "overpriced." In a similar manner, if one is *bearish* on the underlying, he can sometimes combine the purchase of a put with the sale of a call credit spread. Both approaches are described in this section.

THE BULLISH SCENARIO

It sometimes happens that one arrives at a bullish opinion regarding a stock, only to find that the options are very expensive. In fact, they may be so expensive as to preclude thoughts of making an outright call purchase. This might happen, for example, if the stock has suddenly plummeted in price (perhaps during an ongoing, rapid bearish move by the overall stock market). To buy calls at this time would be overly risky. If the underlying began to rally, it would often be the case that the implied volatility of the calls would shrink, thus harming one's long call position.

As a counter to this, it might make sense to buy the call, but at the same time to sell a put credit spread. Recall that a put credit spread is a bullish strategy. Moreover, since it is presumed that the options are expensive on this particular stock, the puts being used in the spread would be expensive as well. Thus, the credit received from the spread would be slightly larger than "normal" because the options are expensive.

Example: XYZ is selling at 100. One wishes to purchase the December 100 call as an outright bullish speculation. That call is selling for 10. However, one determines that the December 100 call is overpriced at these levels. (In order to make this determination, one would use an option model whose techniques are described in Chapter 28 on mathematical applications.) Hence, he decides to use the following put spread *in addition to buying the December 100 call:*

Sell December 90 put, 6
Buy December 80 put, 3

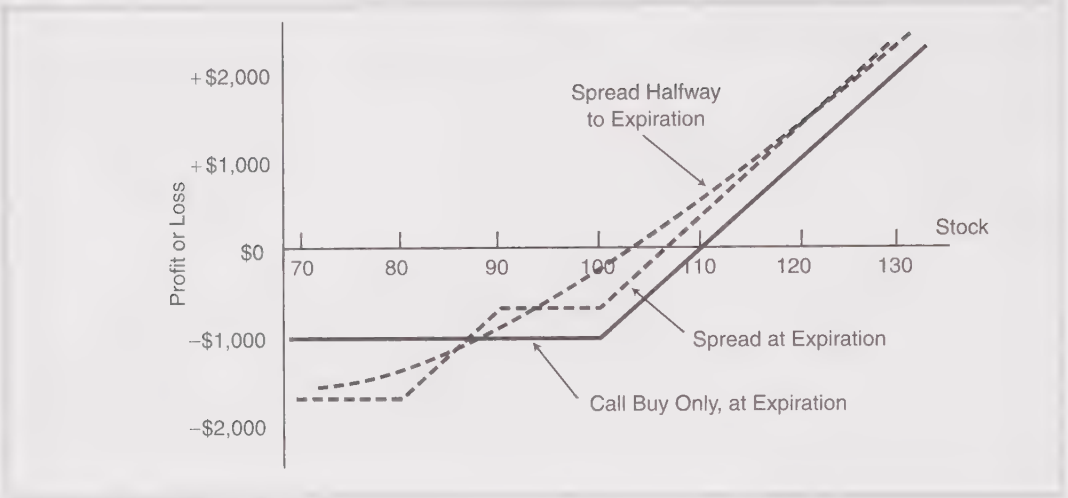
The sale of the put spread brings in a 3-point credit. Thus, his total expenditure for the entire position is 7 points (10 for the December 100 call, less 3 credit from the sale of the put spread). If one is correct about his bullish outlook for the stock (i.e., the stock goes up), he can in some sense consider that he paid 7 for the call. Another way to look at it is this: The sale of the put spread reduces the call price down to a more moderate level, one that might be in line with its "theoretical value." In other words, the call would not be considered expensive if it were priced at 7 instead of 10. The sale of the put spread can be considered a way to reduce the overall cost of the call.

Of course, the sale of the put spread brings some extra risk into the position because, if the stock were to fall dramatically, the put spread could lose 7 points (the width of the strikes in the spread, 10 points, less the initial credit received, 3 points). This, added to the call's cost of 10 points, means that the entire risk here is 17 points. In fact, that is the margin required for this spread as well. Thus, the overall spread still has limited risk, because both the call purchase and the put credit spread are limited-risk strategies. However, the total risk of the two combined is larger than for either one separately.

Remember that one must be bullish on the underlying in order to employ this strategy. So, if his analysis is correct, the upside is what he wants to maximize. If he is wrong on his outlook for the stock, then he needs to employ some sort of stop-loss measures before the maximum risk of the position is realized.

The resulting position is shown in Figure 23-2, along with two other plots. The straight line marked "Spread at expiration" shows how the profitability of the call purchase combined with a bull spread would look at December expiration. In addition, there is a plot with straight lines of the purchase of the December 100 call for 10 points. That plot can be compared with the three-way spread to see where extra risk and reward occur. Note that the three-way spread does better than the outright purchase of the December 100 call as long as the stock is higher than 87 at expiration. Since the stock is initially at 100 and since one is initially bullish on the stock, one would have to surmise that the odds of it falling to 87 are fairly small. Thus, the three-way spread outperforms the outright purchase of the call over a large range of stock prices.

FIGURE 23-2.
Call buy and put credit (bull) spread.



The final plot in Figure 23-2 is that of the three-way spread's profit and losses *halfway* to the expiration date. You can see that it looks much like the profitability of merely owning a call: The curve has the same shape as the call pricing curve shown in Chapter 1.

Hence, this three-way strategy can often be more attractive and more profitable than merely owning a call option. Remember, though, that it *does* increase risk and require a larger collateral deposit than the outright purchase of the at-the-money call would. One can experiment with this strategy, too, in that he might consider buying an out-of-the-money call and selling a put spread that brings in enough credit to completely pay for the call. In that way, he would have no risk as long as the stock remained above the higher striking price used in the put credit spread.

THE BEARISH SCENARIO

In a similar manner, one can construct a position to take advantage of a bearish opinion on a stock. Again, this would be most useful when the options were overpriced and one felt that an at-the-money put was too expensive to purchase by itself.

Example: XYZ is trading at 80, and one has a definite bearish opinion on the stock. However, the December 80 put, which is selling for 8, is expensive according to an option

analysis. Therefore, one might consider *selling* a call credit spread (out-of-the-money) to help reduce the cost of the put. The entire position would thus be:

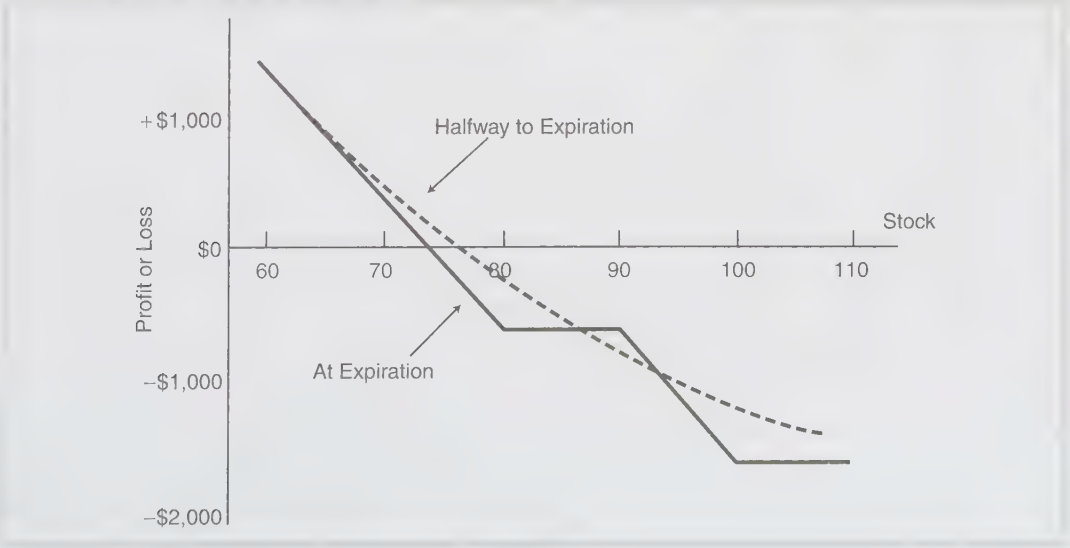
Buy 1 December 80 put:	8 debit
Sell 1 December 90 call:	4 credit
Buy 1 December 100 call:	2 debit
Total cost:	**6 debit ($600)**

The profitability of this position is shown in Figure 23-3. The straight line on that graph shows how the position would behave at expiration. The introduction of the call credit spread has increased the risk to $1,600 if the stock should rally to 100 or higher by expiration. Note that the risk is limited since both the put purchase and the call credit spread are limited-risk strategies. The margin required would be this maximum risk, or $1,600.

The curved line on Figure 23-3 shows how the three-way spread would behave if one looked at it halfway to its expiration date. In that case, it has a curved appearance much like the outright purchase of a put option.

Thus, this strategy could be appealing to bearishly oriented traders, especially when the options are expensive. It might have certain advantages over an outright put purchase in that case, but it *does* require a larger margin investment and has theoretically larger risk.

FIGURE 23-3.
Put buy and call credit (bear) spread.



A SIMPLE FOLLOW-UP ACTION FOR BULL OR BEAR SPREADS

Another way of combining puts and calls in a spread can sometimes be used when one has a bull or bear spread already in place. Suppose that one owns a call bull spread and the underlying stock has advanced nicely. In fact, it is above *both* of the strikes used in the spread. However, as is often the case, the bull spread may not have widened out to its maximum profit potential. One can use the puts for two purposes at this point: (1) to determine whether the call spread is trading at a "reasonable" value, and (2) to try to lock in some profits. First, let's look at an example of the "reasonable value" verification.

Example: A trader buys an XYZ call bull spread for 5 points. The spread uses the January 70 calls and the January 80 calls. Later, XYZ advances to a price of 88, but there is still a good deal of time remaining in the options. Perhaps the spread has widened out only to 7 points at that time. The trader finds it somewhat disappointing that the spread has not widened out to its maximum profit potential of 10 points. However, this is a fairly common occurrence with bull and bear spreads, and is one of the factors that may make them less attractive than outright call or put purchases.

In any case, suppose the following prices exist:

January 80 put, 5
January 70 put, 2

We can use these put prices to verify that the call spread is "in line." Notice that the put spread is 3 points and the call spread is 7 points (both are the January 70–January 80 spread). Thus, they add up to 10 points—the width of the strikes. When that occurs, we can conclude that the spreads are "in line" and are trading at theoretically correct prices.

Knowing this information doesn't help one make any more profits, but it does provide some verification of the prices. Many times, one feels frustrated when he sees that a call bull spread has not widened out as he expected it to. Using the put spread as verification can help keep the strategist "on track" so that he makes rational, not emotional, decisions.

Now let's look at a similar example, in which perhaps the puts can be used to lock in profits on a call bull spread.

Example: Using the same bull spread as in the previous example, suppose that one owns an XYZ call bull spread, having bought the January 70 call and sold the January 80 call for a debit of 5 points. Now assume it is approaching expiration, and the stock is once again at 88. At this time, the spread is theoretically nearing its maximum price of 10.

However, since both calls are fairly deeply in-the-money, the market-makers are making very wide spreads in the calls. Perhaps these are the markets, *with the stock at 88 and only a week or two remaining until expiration:*

Call	Bid Price	Asked Price
January 70 call	17.50	18.50
January 80 call	7.80	8.20

If one were to remove this spread at market prices, he would sell his long January 70 call for 17.50 and would buy his short January 80 call back for 8.20, a credit of 9.30. Since the maximum value of the spread is 10, one is giving away 70 cents, quite a bit for just such a short time remaining.

However, suppose that one looks at the puts and finds these prices:

Put	Bid Price	Asked Price
January 80 put	0.20	0.40
January 70 put	none	0.10

One could "lock in" his call spread profits by buying the January 80 put for 40 cents. Ignoring commissions for a moment, if he bought that put and then held it *along with* the call spread until expiration, he would unwind the call spread for a 10 credit at expiration. He paid 40 cents for the put, so his net credit to exit the spread would be 9.60—considerably better than the 9.30 he could have gotten above for the call spread alone.

This put strategy has one big advantage: If the underlying stock should suddenly collapse and tumble beneath 70—admittedly, a remote possibility—large profits could accrue. The purchase of the January 80 put has protected the bull spread's profits at all prices. But below 70, the put starts to make *extra* money, and the spreader could profit handsomely. Such a drop in price would only occur if some materially damaging news surfaced regarding XYZ Company, but it *does* occasionally happen.

If one utilizes this strategy, he needs to carefully consider his commission costs and the possibility of early assignment. For a professional trader, these are irrelevant, and so the professional trader should endeavor to exit bull spreads in this manner whenever it makes sense. However, if the public customer allows stock to be assigned at 80 and exercises to buy stock at 70, he will have two stock commissions plus one put option commission. That should be compared to the cost of two in-the-money call option commissions to remove the call spread directly. Furthermore, if the public customer receives an early assignment notice on the short January 80 calls, he may need to provide day-trade margin as he exercise his January 70 calls the next day.

Without going into as much detail, a bear spread's profits can be locked in via a similar strategy. Suppose that one owns a January 60 put and has sold a January 50 put to create a bear spread. Later, with the stock at 45, the spreader wants to remove the spread, but again finds that the markets for the in-the-money puts are so wide that he cannot realize anywhere near the 10 points that the spread is theoretically worth. He should then see what the January 50 *call* is selling for. If it is fractionally priced, as it most likely will be if expiration is drawing nigh, then it can be purchased to lock in the profits from the put spread. Again, commission costs should be considered by the public customer before finalizing his strategy.

THREE USEFUL BUT COMPLEX STRATEGIES

The three strategies presented in this section are all designed to limit risk while allowing for large potential profits if correct market conditions develop. Each is a combination strategy—that is, it involves both puts and calls—and each is a calendar strategy, in which near-term options are sold and longer-term options are bought. (A fourth strategy that is similar in nature to those about to be discussed is presented in the next chapter.) Although all of these are somewhat complex and are for the most advanced strategist, they do provide attractive risk/reward opportunities. In addition, the strategies can be employed by the public customer; they are not designed strictly for professionals. All three strategies are described conceptually in this section; specific selection criteria are presented in the next section.

A TWO-PRONGED ATTACK (THE DUAL CALENDAR SPREAD)

A bullish calendar spread was shown to be a rather attractive strategy. A bullish call calendar spread is established with out-of-the-money calls for a relatively small debit. If the near-term call expires worthless and the stock then rises substantially before the longer-term call expires, the profits could potentially be large. In any case, the risk is limited to the small debit required to establish the spread. In a similar manner, the bearish calendar spread that uses put options can be an attractive strategy as well. In this strategy, one would set up the spread with out-of-the-money puts. He would then want the near-term put to expire worthless, followed by a substantial drop in the stock price in order to profit on the longer-term put.

Since both strategies are attractive by themselves, the combination of the two should be attractive as well. That is, *with a stock midway between two striking prices, one might set up a bullish out-of-the-money call calendar spread and simultaneously establish a bearish out-of-the-money put calendar spread.* If the stock remains relatively stable, both

near-term options would expire worthless. Then a substantial stock price movement *in either direction* could produce large profits. With this strategy, the spreader does not care which direction the stock moves after the near options expire worthless; he only hopes that the stock becomes volatile and moves a large distance in either direction.

Example: Suppose that the following prices exist three months before the January options expire:

XYZ common: 65			
January 70 call:	3	January 60 put:	2
April 70 call:	5	April 60 put:	3

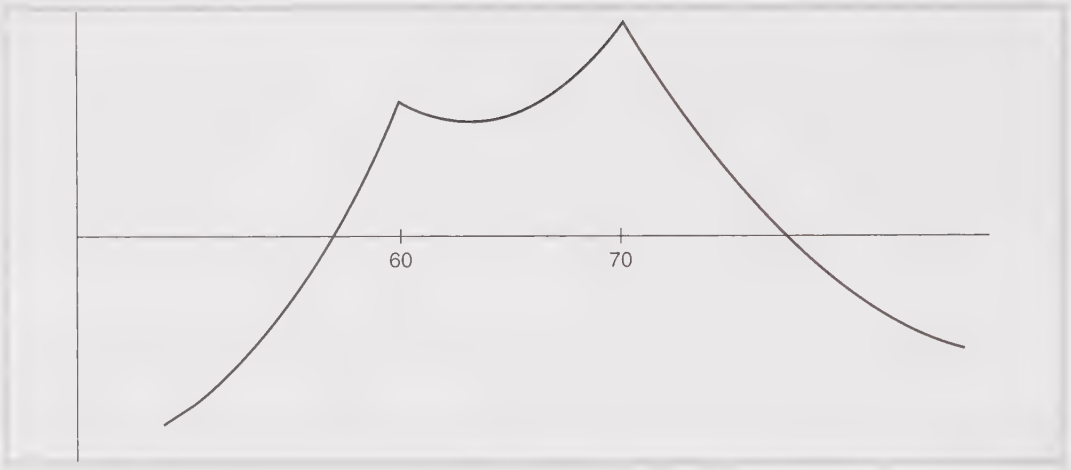
The bullish portion of this combination of calendar spreads would be set up by selling the shorter-term January 70 call for 3 points and simultaneously buying the longer-term April 70 call for 5 points. This portion of the spread requires a 2-point debit. The bearish portion of the spread would be constructed using the puts. The near-term January 60 put would be sold for 2 points, while the longer-term April 60 put would be bought for 3. Thus, the put portion of the spread is a 1-point debit. Overall, then, the combination of the calendar spreads requires a 3-point debit, plus commissions. This debit is the required investment; no additional collateral is required. Since there are four options involved, the commission cost will be large. Again, establishing the spreads in quantity can reduce the percentage cost of commissions.

Note that all the options involved in this position are initially out-of-the-money. The stock is below the striking price of the calls and is above the striking price of the puts. One has sold a near-term put and call combination and purchased a longer-term combination. For nomenclature purposes, this strategy is called a "dual calendar spread."

Figure 23-4 shows the results of the spread at expiration of the near-term options (in April). There are a variety of possible outcomes from this position. First, it should be understood that *the risk is limited to the amount of the initial debit*, 3 points in this example. If the underlying stock should rise dramatically or fall dramatically before the near-term options expire, both the call spread and the put spread will shrink to nearly nothing. This would be the least desirable result. In actual practice, the spread would probably have a small positive differential left even after a premature move by the underlying stock, so that the probability of a loss of the entire debit would be small.

In Figure 23-4, there are two profit peaks, one at each strike. Due to the way that puts and calls are priced in equity options, the peak for the call calendar (at the striking price of 70, in the example) produces a greater profit than the peak for the put calendar, at 60. Those peaks can be evened out if one initially establishes an extra put calendar

FIGURE 23-4.
Dual calendar spread.



spread or two. For example, buying 3 call calendars and 4 put calendars might produce peaks of equal height.

This type of strategy is often very useful when one feels that the underlying stock might gap after the spread is established, but before the near-term options expire. Such a gap might be caused by an earnings announcement, or an FDA hearing for a biotech company, or a potentially volatile lawsuit. In all of these cases, the near-term options would be more expensive, in terms of implied volatility, than the long-term options, making the dual calendar spread a theoretically attractive strategy. One would generally try to estimate the extent of the forthcoming gap, and place the calendars at those spots. The price of the near-term straddle can sometimes be a useful guide.

Example: XYZ is trading at 80, and is due to report earnings. Suppose that XYZ has a history of gapping on its earnings reports. Furthermore, suppose that the nearest-term, July 80 straddle is selling for 10 points. That is more or less the option market's estimate of how far XYZ is going to move on the earnings report. One doesn't know if XYZ will rise or fall on the earnings, but based on whatever information is available, option traders have estimated that the stock will move approximately 10 points on the earnings news. One might therefore buy a call calendar spread with a strike of 90 and a put calendar spread with a strike of 70—each 10 points from the current stock price (actually, he might buy 3 call spreads and 4 put spreads if he wants to balance his profit potential at either strike). He would sell July options (the first expiration *after* the gap is expected to occur) and buy August, September, or October options—whichever is available.

If the near-term options both expire worthless, a profit will generally exist at that time.

Example: If XYZ were still at 65 at January expiration in the prior example, the position should be profitable at that time. The January call and put would expire worthless with XYZ at 65, and the April options might be worth a total of 5 points. The spread could thus be closed for a profit with XYZ at 65 in January, since the April options could be sold for 5 points and the initial "cost" of the spread was only 3 points. Although commissions would substantially reduce this 2-point gross profit, there would still be a good percentage profit on the overall position. If the strategist decides to take his profit at this time, he would be operating in a conservative manner.

However, the strategist may want to be more aggressive and hold onto the April combination in hopes that the stock might experience a substantial movement before those options expire. Should this occur, *the potential profits could be quite large.*

Example: If the stock were to undergo a very bullish move and rise to 100 before April expiration, the April 70 call could be sold for 30 points. (The April 60 put would expire worthless in that case.) Alternatively, if the stock plunged to 30 by April expiration, the put at 60 could be sold for 30 points while the call expired worthless. In either case, the strategist would have made a substantial profit on his initial 3-point investment.

It may be somewhat difficult for the strategist to decide what he wants to do after the near-term options expire worthless. He may be torn between taking the limited profit that is at hand or holding onto the combination that he owns in hopes of larger profits. A reasonable approach for the strategist to take is to do nothing immediately after the near-term options expire worthless. He can hold the longer-term options for some time before they will decay enough to produce a loss in the position. Referring again to the previous example, when the January options expire worthless, the strategist then owns the April combination, which is worth 5 points at that time. He can continue to hold the April options for perhaps 6 or 8 weeks before they decay to a value of 3 points, even if the stock remains close to 65. At this point, the position could be closed for a net loss of the commission costs involved in the various transactions.

As a general rule, one should be willing to hold the combination, even if this means that he lets a small profit decay into a loss. The reason for this is that *one should give himself the maximum opportunity to realize large profits.* He will probably sustain a number of small losses by doing this, but by giving himself the opportunity for large profits, he has a reasonable chance of having the profits outdistance the losses.

There is a time to take small profits in this strategy. This would be when either the puts or the calls were slightly in-the-money as the near-term options expire.

Example: If XYZ moved to 71 just as the January options were expiring, the call portion of the spread should be closed. The January 70 call could be bought back for 1 point and the April 70 call would probably be worth about 5 points. Thus, the call portion of the spread could be "sold" for 4 points, enough to cover the entire cost of the position. The April 60 put would not have much value with the stock at 71, but it should be held just in case the stock should experience a large price decline. Similar results would occur on the put side of the spread if the underlying stock were slightly in-the-money, say at 58 or 59, at January expiration. At no time does the strategist want to risk being assigned on an option that he is short, so he must always close the portion of the position that is in-the-money at near-term expiration. This is only necessary, of course, if the stock has risen above the striking price of the calls or has fallen below the striking price of the puts.

In summary, this is a reasonable strategy if one operates it over a period of time long enough to encompass several market cycles. The strategist must be careful not to place a large portion of his trading capital in the strategy, however, since even though the losses are limited, they still represent his entire net investment. A variation of this strategy, whereby one sells more options than he buys, is described in the next chapter.

THE CALENDAR STRADDLE

Another strategy that combines calendar spreads on both put and call options can be constructed by selling a near-term straddle and simultaneously purchasing a longer-term straddle. Since the time value premium of the near-term straddle will decrease more rapidly than that of the longer-term straddle, one could make profits on a limited investment. This strategy is somewhat inferior to the one described in the previous section, but it is interesting enough to examine.

Example: Suppose that three months before January expiration, the following prices exist:

XYZ common: 40	
January 40 straddle: 5	April 40 straddle: 7

A calendar spread of the straddles could be established by selling the January 40 straddle and simultaneously buying the April 40 straddle. This would involve a cost of 2 points, or the debit of the transaction, plus commissions.

The risk is limited to the amount of this debit *up until the time the near-term straddle expires.* That is, even if XYZ moves up in price by a substantial amount or declines in price by a substantial amount, the worst that can happen is that the difference between the straddle prices shrinks to zero. This could cause one to lose an amount equal to his original debit, plus commissions. *This limit on the risk applies only until the near-term options expire.* If the strategist decides to buy back the near-term straddle and continue to hold the longer-term one, his risk then increases by the cost of buying back the near-term straddle.

Example: XYZ is at 43 when the January options expire. The January 40 call can now be bought back for 3 points. The put expires worthless; so the whole straddle was closed out for 3 points. The April 40 straddle might be selling for 6 points at that time. If the strategist wants to hold on to the April straddle, in hopes that the stock might experience a large price swing, he is free to do so after buying back the January 40 straddle. However, he has now invested a total of 5 points in the position: the original 2-point debit plus the 3 points that he paid to buy back the January 40 straddle. Hence, his risk has increased to 5 points. If XYZ were to be at exactly 40 at April expiration, he would lose the entire 5 points. While the probability of losing the entire 5 points must be considered small, there is a substantial chance that he might lose more than 2 points—his original debit. Thus, he has increased his risk by buying back the near-term straddle and continuing to hold the longer-term one.

This is actually a neutral strategy. Recall that when calendar spreads were discussed previously, it was pointed out that one establishes a neutral calendar spread with the stock near the striking price. This is true for either a call calendar spread or a put calendar spread. This strategy—a calendar spread with straddles—is merely the combination of a neutral call calendar spread and a neutral put calendar spread. Moreover, recall that the neutral calendar spreader generally establishes the position with the intention of closing it out once the near-term option expires. He is mainly interested in selling time in an attempt to capitalize on the fact that a near-term option loses time value premium more rapidly than a longer-term option does. The straddle calendar spread should be treated in the same manner. It is generally best to close it out at near-term expiration. If the stock is near the striking price at that time, a profit will generally result. To verify this, refer again to the prices in the preceding paragraph, with XYZ at 43 at January expiration. The January 40 straddle can be bought back for 3 points and the April 40 straddle can be sold for 6. Thus, the differential between the two straddles has widened to 3 points. Since the original differential was 2 points, this represents a profit to the strategist.

The maximum profit would be realized if XYZ were exactly at the striking price at near-term expiration. In this case, the January 40 straddle could be bought back for a very

small fraction and the April 40 straddle might be worth about 5 points. The differential would have widened from the original 2 points to nearly 5 points in this case.

This strategy is inferior to the one described in the previous section (the "calendar combination"). In order to have a chance for unlimited profits, the investor must increase his net debit by the cost of buying back the near-term straddle. Consequently, this strategy should be used only in cases when the near-term straddle appears to be extremely overpriced. Furthermore, the position should be closed at near-term expiration unless the stock is so close to the striking price at that time that the near-term straddle can be bought back for a fractional price. This fractional buy-back would then give the strategist the opportunity to make large potential profits with only a small increase in his risk. This situation of being able to buy back the near-term straddle at a fractional price will occur very infrequently, much more infrequently than the case in which both the out-of-the-money put and call expire worthless in the previous strategy. Thus, the "calendar combination" strategy will afford the spreader more opportunities for large profits, and will also never force him to increase his risk.

OWNING A "FREE" COMBINATION (THE "DIAGONAL BUTTERFLY SPREAD")

The strategies described in the previous sections are established for debits. This means that even if the near-term options expire worthless, the strategist still has risk. The long options he then holds could proceed to expire worthless as well, thereby leaving him with an overall loss equal to his original debit. There is another strategy involving both put and call options that gives the strategist the opportunity to own a "free" combination. That is, the profits from the near-term options could equal or exceed the entire cost of his long-term options.

This strategy consists of selling a near-term straddle and simultaneously purchasing both a longer-term, out-of-the-money call and a longer-term, out-of-the-money put. This differs from the protected straddle write previously described in that the long options have a more distant maturity than do the short options.

Example:

XYZ common: 40	
April 35 put:	1.50
January 40 straddle:	7
April 45 call:	2.50

If one were to sell the short-term January 40 straddle for 7 points and simultaneously purchase the out-of-the-money put and call combination—April 35 put and April 45 call—he *would establish a credit spread.* The credit for the position is 3 points less commissions, since

7 points are brought in from the straddle sale and 4 points are paid for the out-of-the-money combination. Note that the position technically consists of a bearish spread in the calls—buy the higher strike and sell the lower strike—coupled with a bullish spread in the puts—buy the lower strike and sell the higher strike. The investment required is in the form of collateral since both spreads are credit spreads, and is equal to the differential in the striking prices, less the net credit received. In this example, then, the investment would be 10 points for the striking price differential (5 points for the calls and 5 points for the puts) less the 3-point credit received, for a total collateral requirement of $700, plus commissions.

The potential results from this position may vary widely. However, *the risk is limited before near-term expiration.* If the underlying stock should advance substantially before January expiration, the puts would be nearly worthless and the calls would both be trading near parity. With the calls at parity, the strategist would have to pay, at most, 5 points to close the call spread, since the striking prices of the calls are 5 points apart. In a similar manner, if the underlying stock had declined substantially before the near-term January options expired, the calls would be nearly worthless and the puts would be at parity. Again, it would cost a maximum of 5 points to close the put spread, since the difference in the striking prices of the puts is also 5 points. The worst result would be a 2-point loss in this example—3 points of credit were initially received, and the most that the strategist would have to pay to close the position is 5 points. This is the theoretical risk. In actual practice, it is very unlikely that the calls would trade as much as 5 points apart, even if the underlying stock advanced by a large amount, because the longer-term call should retain some small time value premium even if it is deeply in-the-money. A similar analysis might apply to the puts. The risk can always be quickly computed as being equal to the difference between two contiguous striking prices (two strikes next to each other), less the net credit received.

The strategist's objective with this position is to be able to buy back the near-term straddle for a price less than the original credit received. If he can do this, he will own the longer-term combination for free.

Example: Near January expiration, the strategist is able to repurchase the January 40 straddle for 2 points. Since he initially received a 3-point credit and is then able to buy back the written straddle for 2 points, he is left with an overall credit in the position of 1 point, less commissions. Once he has done this, the strategist retains the long options, the April 35 put and April 45 call. *If the underlying stock should then advance substantially or decline substantially, he could make very large profits.* However, even if the long combination expires worthless, the strategist still makes a profit, since he was able to buy the straddle back for less than the amount of the original credit.

In this example, the strategist's objective is to buy back the January 40 straddle for less than 3 points, since that is the amount of the initial credit. At expiration, this would

mean that the stock would have to be between 37 and 43 for the buy-back to be made for 3 points or less. Although it is possible, certainly, that the stock will be in this fairly narrow range at near-term expiration, it is not probable. However, the strategist who is willing to add to his risk slightly can often achieve the same result by "legging out" of the January 40 straddle. It has repeatedly been stated that one should not attempt to leg out of a spread, but this is an exception to that rule, since one owns a long combination and therefore is protected; he is not subjecting himself to large risks by attempting to "leg out" of the straddle he has written.

Example: XYZ rallies before January expiration and the January 40 put drops to a price of .50 during the rally. Even though there is time remaining until expiration, the strategist might decide to buy back the put at .50. This could potentially increase his overall risk by 50 cents if the stock continues to rise. However, if the stock then reversed itself and fell, he could attempt to buy the call back at 2.50 points or less. In this manner, he would still achieve his objective of buying the short-term straddle back for 3 points or less. In fact, he might be able to close both sides of the straddle well before near-term expiration if the underlying stock first moves quickly in one direction and then reverses direction by a large amount.

The maximum risk and the optimum potential objectives have been described, but interim results might also be considered in this strategy.

Example: XYZ is at 44 at January expiration. The January 40 straddle must be bought back for 4 points. This means that the long combination will not be owned free, but will have a cost of 1 point plus commissions. The strategist must decide at this time if he wants to hold on to the April options or if he wants to sell them, possibly producing a small overall profit on the entire position. There is no ironclad rule in this type of situation. If the decision is made to hold on to the longer-term options, the strategist realizes that he has assumed additional risk by doing so. Nevertheless, he may decide that it is worth owning the long combination at a relatively low cost. The cost in this example would be 1 point plus commissions, since he paid 4 points to buy back the straddle after only taking in a 3-point credit initially. The more expensive the buy-back of the near-term straddle is, the more the strategist should be readily willing to sell his long options at the same time. For example, if XYZ were at 48 at January expiration and the January 40 straddle had to be bought back for 8 points, there should be no question that he should simultaneously sell his April options as well. The most difficult decisions come when the stock is just outside the optimum buy-back area at near-term expiration. In this example, the strategist would have a fairly difficult decision if XYZ were in the 44 to 45 area or in the 35 to 36 area at January expiration.

The reader may recall that, in Chapter 14 on diagonalizing a spread, it was mentioned that one is sometimes able to own a call free by entering into a diagonal credit spread. A diagonal bear spread was given as an example. The same thing happens to be true of a diagonal bullish put spread, since that is a credit spread as well. The strategy discussed in this section is merely a combination of a diagonal bearish call spread and a diagonal bullish put spread *and is known as a "diagonal butterfly spread."* The same concept that was described in Chapter 14—being able to make more on the short-term call than one originally paid for the long-term call—applies here as well. *One enters into a credit position with the hope of being able to buy back the near-term written options for a profit greater than the cost of the long options.* If he is able to do this, he will own options for free and could make large profits if the underlying stock moves substantially in either direction. Even if the stock does not move after the buy-back, he still has no risk. *The risk occurs prior to the expiration of the near-term options, but this risk is limited.* As a result, this is an attractive strategy that, when operated over a period of market cycles, should produce some large profits. Ideally, these profits would offset any small losses that had to be taken. Since large commission costs are involved in this strategy, the strategist is reminded that establishing the spreads in quantity can help to reduce the percentage effect of the commissions.

SELECTING THE SPREADS

Now that the concepts of these three strategies have been laid out, let us define selection criteria for them. The "calendar combination" is the easiest of these strategies to spot. One would like to have the stock nearly halfway between two striking prices. The most attractive positions can normally be found when the striking prices are at least 10 points apart and the underlying stock is relatively volatile. The optimum time to establish the "calendar combination" is two or three months before the near-term options expire. Additionally, one would like the sum of the prices of the near-term options to be equal to at least one-half of the cost of the longer-term options. In the example given in the previous section on the "calendar combination," the near-term combination was sold for 5 points, and the longer-term combination was bought for 8 points. Thus, the near-term combination was worth more than one-half of the cost of the longer-term combination. These five criteria can be summarized as follows:

1. Relatively volatile stock.
2. Stock price nearly midway between two strikes.
3. Striking prices at least 10 points apart.

4. Two or three months remaining until near-term expiration.
5. Price of near-term combination greater than one-half the price of the longer-term combination.

Even though five criteria have been stated, it is relatively easy to find a position that satisfies all five conditions. The strategist may also be able to rely upon technical input. If the stock seems to be in a near-term trading range, the position may be more attractive, for that would indicate that the chances of the near-term combination expiring worthless are enhanced.

The "calendar straddle" is a strategy that looks deceptively attractive. As the reader should know by now, options do not decay in a linear fashion. Instead, options tend to hold time value premium until they get quite close to expiration, when the time value premium disappears at a fast rate. Consequently, the sale of a near-term straddle and the simultaneous purchase of a longer-term straddle often appear to be attractive because the debit seems small. Again, certain criteria can be set forth that will aid in selecting a reasonably attractive position. The stock should be at or very near the striking price when the position is established. Since this is basically a neutral strategy, one that offers the largest potential profits at near-term expiration, one should want to sell the most time premium possible. This is why the stock must be near the striking price initially. The underlying stock does not have to be a volatile one, although volatile stocks will most easily satisfy the next two criteria. The near-term credit should be at least two-thirds of the longer-term debit. In the example used to explain this strategy, the near-term straddle was sold for 5, while the longer-term straddle was bought for 7 points. Thus, the near-term straddle was worth more than two-thirds of the longer-term straddle's price. Finally, the position should be established with two to four months remaining until near-term expiration. If positions with a longer time remaining are used, there is a significant probability that the underlying stock will have moved some distance away from the striking price by the time the near-term options expire. Summarizing, the three criteria for a "calendar straddle" are:

1. Stock near striking price initially.
2. Two to four months remaining until near-term expiration.
3. Near-term straddle price at least two-thirds of longer-term straddle price.

The "diagonal butterfly" is the most difficult of these three types of positions to locate. Again, one would like the stock to be near the middle striking price when the position is established. Also, one would like the underlying stock to be somewhat volatile, since there is the possibility that long-term options will be owned for free. If this comes to pass, the strategist wants the stock to be capable of a large move in order to have a chance of generat-

ing large profits. The most restrictive criterion—one that will eliminate all but a few possibilities on a daily basis—is that the near-term straddle price should be at least one and one-half times that of the longer-term, out-of-the-money combination. By adhering to this criterion, one gives himself a reasonable chance of being able to buy the near-term straddle back for a price low enough to result in owning the longer-term options for free. In the example used to describe this strategy, the near-term straddle was sold for 7 while the out-of-the-money, longer-term combination cost 4 points. This satisfies the criterion. Finally, one should limit his possible risk before near-term expiration. Recall that the risk is equal to the difference between any two contiguous striking prices, less the net credit received. In the example, the risk would be 5 minus 3, or 2 points. The risk should always be less than the credit taken in. This precludes selling a near-term straddle at 80 for 4 points and buying the put at 60 and the call at 100 for a combined cost of 1 point. Although the credit is substantially more than one and one-half times the cost of the long combination, the risk would be ridiculously high. The risk, in fact, is 20 points (the difference between two contiguous striking prices) less the 3 points credit, or 17 points—much too high.

The criteria can be summarized as follows:

1. Stock near middle striking price initially.
2. Three to four months to near-term expiration.
3. Price of written straddle at least one and one-half times that of the cost of the longer-term, out-of-the-money combination.
4. Risk before near-term expiration less than the net credit received.

One way in which the strategist may notice this type of position is when he sees a relatively short-term straddle selling at what seems to be an outrageously high price. Professionals, who often have a good feel for a stock's short-term potential, will sometimes bid up straddles when the stock is about to make a volatile move. This will cause the near-term straddles to be very overpriced. When a straddle seller notices that a particular straddle looks too attractive as a sale, he should consider establishing a diagonal butterfly spread instead. He still sells the overpriced straddle, but also buys a longer-term, out-of-the-money combination as a hedge against a large loss. Both factions can be right. Perhaps the stock will experience a very short-term volatile movement, proving that the professionals were correct. However, this will not worry the strategist holding a diagonal butterfly, for he has limited risk. Once the short-term move is over, the stock may drift back toward the original strike, allowing the near-term straddle to be bought back at a low price—the eventual objective of the strategist utilizing the diagonal butterfly spread.

These are admittedly three quite complex strategies and thus are not to be attempted by a novice investor. If one wants to gain experience in how he would operate such a

strategy, it would be far better to operate a "paper strategy" for a while. That is, one would not actually make investments, but would instead follow prices in the newspaper and make day-to-day decisions without actual risk. This will allow the inexperienced strategist to gain a feel for how these complex strategies perform over a particular time period. The astute investor can, of course, obtain price history information and track a number of market cycles in this same way.

SUMMARY

Puts and calls can be combined to make some very attractive positions. The addition of a call or put credit spread to the outright purchase of a put or call can enhance the overall profitability of the position, especially if the options are expensive. In addition, three advanced strategies were presented that combined puts and calls at various expiration dates. These three various types of strategies that involve calendar combinations of puts and calls may all be attractive. One should be especially alert for these types of positions when near-term calls are overpriced. Typically, this would be during, or just after, a bullish period in the stock market. For nomenclature purposes, these three strategies are called the "calendar combination," the "calendar straddle," and the "diagonal butterfly."

All three strategies offer the possibility of large potential profits if the underlying stock remains relatively stable until the near-term options expire. In addition, all three strategies have limited risk, even if the underlying stock should move explosively in either direction prior to near-term expiration. If an intermediate result occurs—for example, the stock moves a moderate distance in either direction before near-term expiration—it is still possible to realize a limited profit in any of the strategies, because of the fact that the time premiums decay much more rapidly in the near-term options than they do in the longer-term options.

The three strategies have many things in common, but each has its own advantages and disadvantages. The "diagonal butterfly" is the only one of the three strategies whereby the strategist has a possibility of owning free options. Admittedly, the probability of actually being able to own the options completely for free is small. However, there is a relatively large probability that one can substantially reduce the cost of the long options. The "calendar combination," the first of the three strategies discussed, offers the largest probability of capturing the entire near-term premium. This is because both near-term options are out-of-the-money to begin with. The "calendar straddle" offers the largest potential profits at near-term expiration. That is, if the stock is relatively unchanged from the time the position was established until the time the near-term options expire, the "calendar straddle" will show the best profit of the three strategies at that time.

Looking at the negative side, the "calendar straddle" is the least attractive of the three strategies, primarily because one is forced to increase his risk after near-term expiration, if he wants to continue to hold the longer-term options. It is often difficult to find a "diagonal butterfly" that offers enough credit to make the position attractive. Finally, the "calendar combination" has the largest probability of losing the entire debit eventually, because one may find that the longer-term options expire worthless also. (They are out-of-the-money to begin with, just as the near-term options were.)

The strategist will not normally be able to find a large number of these positions available at attractive price levels at any particular time in the market. However, since they are attractive strategies with little or no margin collateral requirements, the strategist should constantly be looking for these types of positions. A certain amount of cash or collateral should be reserved for the specific purpose of utilizing it for these types of positions—perhaps 15 to 20% of one's dollars.

CHAPTER 24

Ratio Spreads Using Puts

The put option spreader may want to sell more puts than he owns. This creates a ratio spread. Basically, two types of put ratio spreads may prove to be attractive: the standard ratio put spread and the ratio calendar spread using puts. Both strategies are designed for the more aggressive investor; when operated properly, both can present attractive reward opportunities.

THE RATIO PUT SPREAD

This strategy is designed for a neutral to slightly bearish outlook on the underlying stock. In a ratio put spread, one buys a number of puts at a higher strike and sells more puts at a lower strike. This position involves naked puts, since one is short more puts than he is long. *There is limited upside risk in the position*, but the downside risk can be very large. The maximum profit can be obtained if the stock is exactly at the striking price of the written puts at expiration.

Example: Given the following:

XYZ common, 50;
XYZ January 45 put, 2; and
XYZ January 50 put, 4.

A ratio put spread might be established by buying one January 50 put and simultaneously selling two January 45 puts. Since one would be paying $400 for the purchased put and would be collecting $400 from the sale of the two out-of-the-money puts, the spread could be done for even money. There is no upside risk in this position. If XYZ should rally

and be above 50 at January expiration, all the puts would expire worthless and the result would be a loss of commissions. However, there is downside risk. If XYZ should fall by a great deal, one would have to pay much more to buy back the two short puts than he would receive from selling out the one long put. The maximum profit would be realized if XYZ were at 45 at expiration, since the short puts would expire worth 5 points and could be sold at that price. Table 24-1 and Figure 24-1 summarize the position. Note that there is a range within which the position is profitable—40 to 50 in this example. If XYZ is above 40 and below 50 at January expiration, there will be some profit, before commissions, from the spread. Below 40 at expiration, losses will be generated and, although these losses are limited by the fact that a stock cannot decline in price below zero, these losses could become very large. There is no upside risk, however, as was pointed out earlier. The following formulae summarize the situation for any put ratio spread:

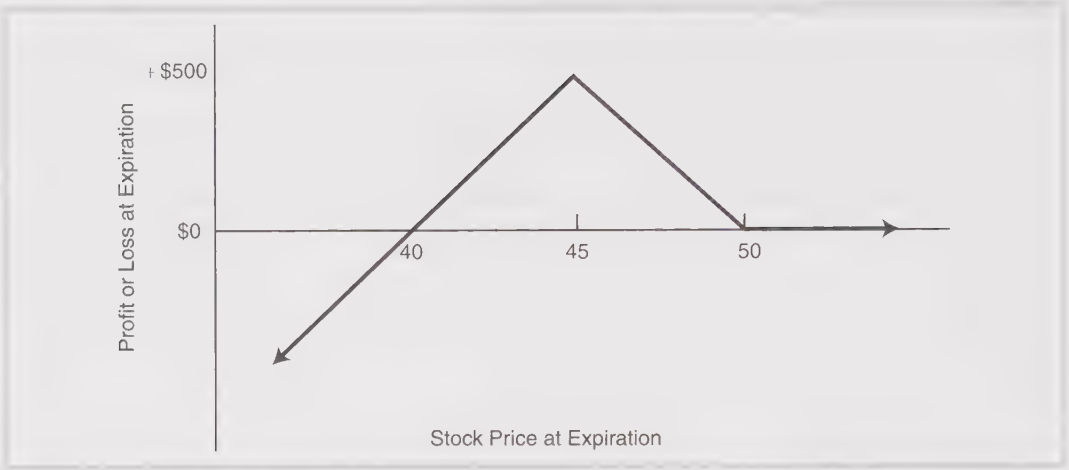
Maximum upside risk	=	Net debit of spread (no upside risk if done for a credit)
Maximum profit potential	=	Striking price differential × Number of long puts – Net debit (or plus net credit)
Downside break-even price	=	Lower strike price – Maximum profit potential ÷ Number of naked puts

The investment required for the put ratio spread consists of the collateral requirement necessary for a naked put, plus or minus the credit or debit of the entire position. Since the collateral requirement for a naked option is 20% of the stock price, plus the

TABLE 24-1.
Ratio put spread.

XYZ Price at Expiration	Long January 50 Put Profit	Short 2 January 45 Put Profit	Total Profit
20	+$2,600	–$4,600	–$2,000
30	+ 1,600	– 2,600	– 1,000
40	+ 600	– 600	0
42	+ 400	– 200	+ 200
45	+ 100	+ 400	+ 500
48	– 200	+ 400	+ 200
50	– 400	+ 400	0
60	– 400	+ 400	0

FIGURE 24-1.
Ratio put spread.



premium, minus the amount by which the option is out-of-the-money, the actual dollar requirement in this example would be $700 (20% of $5,000, plus the $200 premium, minus the $500 by which the January 45 put is out-of-the-money). As with all types of naked writing positions, the strategist should allow enough collateral for an adverse stock move to occur. This will allow enough room for stock movement without forcing early liquidation of the position due to a margin call. If, in this example, the strategist felt that he might stay with the position until the stock declined to 39, he should allow $1,380 in collateral (20% of $3,900 plus the $600 in-the-money amount).

The ratio put spread is generally most attractive when the underlying stock is initially between the two striking prices. That is, if XYZ were somewhere between 45 and 50, one might find the ratio put spread used in the example attractive. If the stock is initially below the lower striking price, a ratio put spread is not as attractive, since the stock is already too close to the downside risk point. Alternatively, if the stock is too far above the striking price of the written calls, one would normally have to pay a large debit to establish the position. Although one could eliminate the debit by writing four or five short options to each put bought, large ratios have extraordinarily large downside risk and are therefore very aggressive.

Follow-up action is rather simple in the ratio put spread. There is very little that one need do, except for closing the position if the stock breaks below the downside break-even point. Since put options tend to lose time value premium rather quickly after they become in-the-money options, there is not normally an opportunity to roll down. Rather, one should be able to close the position with the puts close to parity if the stock breaks below

the downside break-even point. The spreader may want to buy in additional long puts, as was described for call spreads in Chapter 11, but this is not as advantageous in the put spread because of the time value premium shrinkage.

This strategy may prove psychologically pleasing to the less experienced investor because he will not lose money on an upward move by the underlying stock. Many of the ratio strategies that involve call options have upside risk, and a large number of investors do not like to lose money when stocks move up. Thus, although these investors might be attracted to ratio strategies because of the possibility of collecting the profits on the sale of multiple out-of-the-money options, they may often prefer ratio put spreads to ratio call spreads because of the small upside risk in the put strategy.

There is a variation of the put ratio spread that can sometimes be even more attractive, for it pushes the downside break-even point even lower—thereby reducing the chance that the stock will fall below it.

Example: Using three strikes in the put ratio spread.
Suppose the following prices exist:

XYZ: 127
XYZ December 125 put: 3.00
XYZ December 121 put: 2.00
XYZ December 116 put: 1.25

These are fairly typical one-month option prices for a broad-based index or ETF, such as SPY. The implied volatility of the options with the lower strikes is greater than the implied volatility of the highest strike. A put ratio spread can be established as follows:

Buy 1 Dec 125 put, and Sell 1 Dec 121 put, and Sell 1 Dec 116 put
For a net overall credit of 0.25.

This is similar to the put ratio spread described above. If XYZ is above 125 at expiration, the position will profit by the amount of the initial credit, 25 cents. However, there is a rather wide profit range for this spread, and the maximum profit is attainable over a good portion of that range.

Downside break-even = Lower Strike – (Difference in two Higher Strikes) – Net credit
= 116 – (125 – 121) – 0.25
= 111.75

So this spread will not lose money at expiration unless XYZ falls below 111.75. Since it is 127 at the time the spread is established, that is a sizeable downside cushion.

FIGURE 24-2.
Ratio put spread using three strikes.

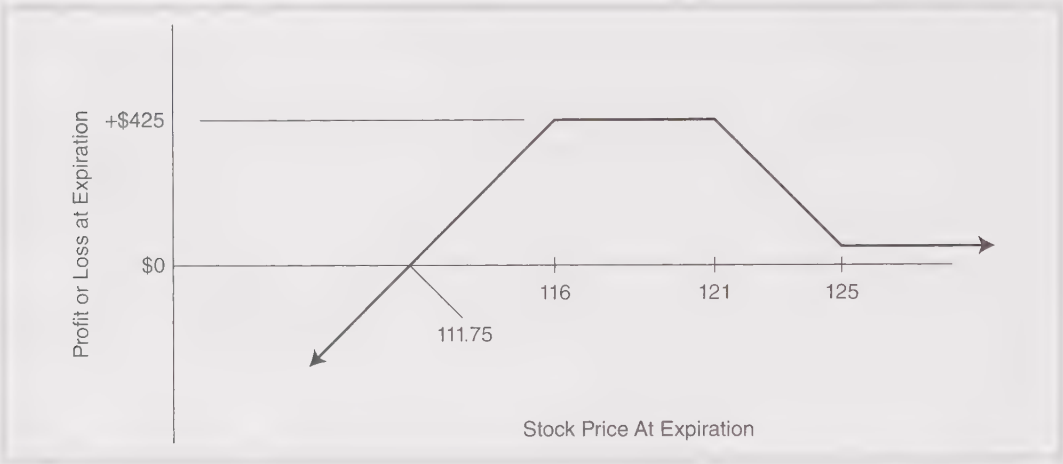


Figure 24-2 shows the profit graph for this spread.

Furthermore, the maximum profit potential of the spread is attainable at any point between the two lower strikes—anywhere between 116 and 121 in this example.

$$\text{Maximum Profit Potential} = (\text{Difference in two Higher Strikes}) + \text{Net credit}$$
$$= (125 - 121) + 0.25 = 4.25$$

One must margin the 116 put as a naked put. The other two puts constitute a bear spread, and thus don't require any collateral. It is generally wise to margin the put as if the stock were at the lower strike, in order to allow some excess collateral, so that a margin call isn't generated as soon as the underlying begins to drop in price.

Once the position is in place, it should be monitored in case the underlying begins to decline. If that happens, a profit may exist—before expiration—as the underlying falls through the maximum profit potential area (between 116 and 121 in this example). If that is the case, the spreader may want to remove part or all of the position to take a profit, especially if he is worried that a far greater price drop might occur.

On the upside, if the underlying is slightly above the upper strike—say up to 130 in this example—a profit greater than the initial credit may exist as well. This has to do with the rate at which options decay, and so if the underlying is near 128, for example, with a week to go, the entire spread might be able to be removed for a *credit*.

Hence it is possible to establish this type of position for a credit, and then to exit later for another credit. This is the object of this strategy and it is often attainable. The worry,

of course, is the downside risk, but if the spreader monitors that and exits when the downside break-even point is breached (even if overall losses have to be taken at that time), the net effects of this strategy over time are quite favorable.

USING DELTAS

The "delta spread" concept can also be used for establishing and adjusting neutral ratio put spreads. The delta spread was first described in Chapter 11. A neutral put spread can be constructed by using the deltas of the two put options involved in the spread. The neutral ratio is determined by dividing the delta of the put at the higher strike by the delta of the put at the lower strike. Referring to the previous example, suppose the delta of the January 45 put is –.30 and the delta of the January 50 put is –.50. Then a neutral ratio would be 1.67 (–.50 divided by –.30). That is, 1.67 puts would be sold for each put bought. One might thus sell 5 January 45 puts and buy 3 January 50 puts.

This type of spread would not change much in price for small fluctuations in the underlying stock price. However, as time passes, the preponderance of time value premium sold via the January 45 puts would begin to turn a profit. As the underlying stock moves up or down by more than a small distance, the neutral ratio between the two puts will change. The spreader can adjust his position back into a neutral one by selling more January 45's or buying more January 50's.

THE RATIO PUT CALENDAR SPREAD

The ratio put calendar spread consists of buying a longer-term put and selling a larger quantity of shorter-term puts, all with the same striking price. The position is generally established with out-of-the-money put—that is, the stock is above the striking price—so that there is a greater probability that the near-term puts will expire worthless. Also, the position should be established for a credit, such that the money brought in from the sale of the near-term puts more than covers the cost of the longer-term put. If this is done and the near-term puts expire worthless, the strategist will then own the longer-term put free, and large profits could result if the stock subsequently experiences a sizable downward movement.

Example: If XYZ were at 55, and the January 50 put was at 1.50 with the April 50 at 2, one could establish a ratio put calendar spread by buying the April 50 and selling two January 50 puts. This is a credit position, because the sale of the two January 50 puts would bring in $300 while the cost of the April 50 put is only $200. If the stock remains

above 50 until January expiration, the January 50 puts will expire worthless and the April 50 put will be owned for free. In fact, even if the April 50 put should then expire worthless, the strategist will make a small profit on the overall position in the amount of his original credit—$100—less commissions. However, after the Januarys have expired worthless, if XYZ should drop dramatically to 25 or 20, a very large profit would accrue on the April 50 put that is still owned.

The risk in the position could be very large if the stock should drop well below 50 before the January puts expire. For example, if XYZ fell to 30 prior to January expiration, one would have to pay $4,000 to buy back the January 50 puts and would receive only $2,000 from selling out his long April 50 put. This would represent a rather large loss. Of course, this type of tragedy can be avoided by taking appropriate follow-up action. *Normally, one would close the position if the stock fell more than 8 to 10% below the striking price before the near-term puts expire.*

As with any type of ratio position, naked options are involved. This increases the collateral requirement for the position and also means that the strategist should allow enough collateral in order for the follow-up action point to be reached. In this example, the initial requirement would be $750 (20% of $5,500, plus the $150 January premium, less the $500 by which the naked January 50 put is out-of-the-money). However, if the strategist decides that he will hold the position until XYZ falls to 46, he should allow $1,320 in collateral (20% of $4,600 plus the $400 in-the-money amount). Of course, the $100 credit, less commissions, generated by the initial position can be applied against these collateral requirements.

This strategy is a sensible one for the investor who is willing to accept the risk of writing a naked put. Since the position should be established with the stock above the striking price of the put options, there is a reasonable chance that the near-term puts will expire worthless. This means that some profit will be generated, and that the profit could be large if the stock should then experience a large downward move before the longer-term puts expire. One should take care, however, to limit his losses before near-term expiration, since the eventual large profits will be able to overcome a series of small losses, but could not overcome a preponderance of large losses.

RATIO PUT CALENDARS

Using the deltas of the puts in the spread, the strategist can construct a neutral position. If the puts are initially out-of-the-money, then the neutral spread generally involves selling more puts than one buys. Another type of ratioed put calendar can be constructed with in-the-money puts. As with the companion in-the-money spread with calls, one would buy more puts than he sells in order to create a neutral ratio.

In either case, the delta of the put to be purchased is divided by the delta of the put to be sold. The result is the neutral ratio, which is used to determine how many puts to sell for each one purchased.

Example: Consider the out-of-the-money case. XYZ is trading at 59. The January 50 put has a delta of 0.10 and the April 50 put has a delta of –0.17. If a calendar spread is to be established, one would be buying the April 50 and selling the January 50. Thus, the neutral ratio would be calculated as 1.7 to 1 (–0.17/–0.10). Seventeen puts would be sold for every 10 purchased.

This spread has naked puts and therefore has large risk if the underlying stock declines too far. However, follow-up action could be taken if the stock dropped in an orderly manner. Such action would be designed to limit the downside risk.

Conversely, the calendar spread using in-the-money puts would normally have one buying more options than he is selling. An example using deltas will demonstrate this fact:

Example: XYZ is at 59. The January 60 put has a delta of –0.45 and the April 60 put has a delta of –0.40. It is normal for shorter-term, in-the-money options to have a delta that is larger (in absolute terms) than longer-term, in-the-money options.

The neutral ratio for this spread would be 0.889 (–0.40/–0.45). That is, one would sell only 0.889 puts for each one he bought. Alternatively stated, he would sell 8 and buy 9.

A spread of this type has no naked puts and therefore does have large downside profit potential. If the stock should rise too far, the loss is limited to the initial debit of the spread. The optimum result would occur if the stock were at the strike at expiration because, even though the excess long put would lose money in that case, the spreads involving the other puts would overcome that small loss.

Another risk of the in-the-money put spread is that one might be assigned rather quickly if the stock should drop. In fact, one must be careful not to establish the spread with puts that are too deeply in-the-money, for this reason. While being put will not necessarily change the profitability of the spread, it will mean increased commission costs and margin charges for the customer, who must buy the stock upon assignment.

A LOGICAL EXTENSION (THE RATIO CALENDAR COMBINATION)

The previous section demonstrated that ratio put calendar spreads can be attractive. The ratio call calendar spread was described earlier as a reasonably attractive strategy for the bullish investor. A logical combination of these two types of ratio calendar spreads (put

and call) would be the *ratio combination*—buying a longer-term out-of-the-money combination and selling several near-term out-of-the-money combinations.

Example: The following prices exist:

XYZ common: 55	
XYZ January 50 put: 1.50	XYZ April 50 put: 2
XYZ January 60 call: 3.50	XYZ April 60 call: 5

One could sell the near-term January combination (January 50 put and January 60 call) for 5 points. It would cost 7 points to buy the longer-term April combination (April 50 put and April 60 call). By selling more January combinations than April combinations bought, a ratio calendar combination could be established. For example, suppose that a strategist sold two of the near-term January combinations, bringing in 10 points, and simultaneously bought one April combination for 7 points. This would be a credit position, a credit of 3 points in this example. If the near-term, out-of-the-money combination expires worthless, a guaranteed profit of 3 points will exist, even if the longer-term options proceed to expire totally worthless. *If the near-term combination expires worthless, the longer-term combination is owned for free, and a large profit could result on a substantial stock price movement in either direction.*

Although this is a superbly attractive strategy if the near-term options do, in fact, expire worthless, it must also be monitored closely so that large losses do not occur. These large losses would be possible if the stock broke out in either direction too quickly, before the near-term options expire. In the absence of a technical opinion on the underlying stock, one can generally compute a stock price at which it might be reasonable to take follow-up action. This is a similar analysis to the one described for ratio call calendar spreads in Chapter 12. Suppose the stock in this example began to rally. There would be a point at which the strategist would have to pay 3 points of debit to close the call side of the combination. That would be his break-even point.

Example: With XYZ at 65 at January expiration (5 points above the higher strike of the original combination), the near-term January 60 call would be worth 5 points and the longer-term April 60 call might be worth 7 points. If one closed the call side of the combination, he would have to pay 10 points to buy back two January 60 calls, and would receive 7 points from selling out his April 60. This closing transaction would be a 3-point debit. This represents a break-even situation up to this point in time, except for commissions,

since a 3-point credit was initially taken in. The strategist would continue to hold the April 50 put (the January 50 put would expire worthless) just in case the improbable occurs and the underlying stock plunges below 50 before April expiration. A similar analysis could be performed for the put side of the spread in case of an early downside breakout by the underlying stock. It might be determined that the downside break-even point at January expiration is 46, for example. Thus, the strategist has two parameters to work with in attempting to limit losses in case the stock moves by a great deal before near-term expiration: 65 on the upside and 46 on the downside. In practice, if the stock should reach these levels *before*, rather than *at*, January expiration, the strategist would incur a small loss by closing the in-the-money side of the combination. This action should still be taken, however, *as the objective of risk management of this strategy is to take small losses, if necessary.* Eventually, large profits may be generated that could more than compensate for any small losses that were incurred.

The foregoing follow-up action was designed to handle a volatile move by the underlying stock prior to near-term expiration. Another, perhaps more common, time when follow-up action is necessary is when the underlying stock is relatively unchanged at near-term expiration. If XYZ in the example above were near 55 at January expiration, a relatively large profit would exist at that time: The near-term combination would expire worthless for a gain of 10 points on that sale, and the longer-term combination would probably still be worth about 5 points, so that the unrealized loss on the April combination would be only 2 points. This represents a total (realized and unrealized) gain of 8 points. In fact, *as long as the near-term combination can be bought back for less than the original 3-point credit of the position, the position will show a total unrealized gain at near-term expiration.* Should the gain be taken, or should the longer-term combination be held in hopes of a volatile move by the underlying stock? Although the strategist will normally handle each position on a case-by-case basis, the general philosophy should be to hold on to the April combination. A profit is already guaranteed at this time—the worst that can happen is a 3-point profit (the original credit). Consequently, the strategist should allow himself the opportunity to make large profits. The strategist may want to attempt to trade out of his long combination, since he will not risk making the position a losing one by doing so. Technical analysis may be able to provide him with buy or sell zones on the stock, and he would then consider selling out his long options in accordance with these technical levels.

In summary, *this strategy is very attractive and should be utilized by strategists who have the expertise to trade in positions with naked options.* As long as risk management principles of taking small losses are adhered to, there will be a large probability of overall profit from this strategy.

PUT OPTION SUMMARY

This concludes the section on put option strategies. The put option is useful in a variety of situations. First, it represents a more attractive way to take advantage of a bearish attitude with options. Second, the use of the put options opens up a new set of strategies—straddles and combinations—that can present reasonably high levels of profit potential. Many of the strategies that were described in Part II for call options have been discussed again in this part. Some of these strategies were described more fully in terms of philosophy, selection procedures, and follow-up action when they were first discussed. The second description—the one involving put options—was often shortened to a more mechanical description of how puts fit into the strategy. This format is intentional. The reader who is planning to employ a certain strategy that can be established with either puts or calls (a bear spread, for example) should familiarize himself with both applications by a simultaneous review of the call chapter and its analogous put chapter.

The combination strategies generally introduced new concepts to the reader. The combination allows the construction of positions that are attractive with either puts or calls (out-of-the-money calendar spreads, for example) to be combined into one position. The four combination strategies that involve selling short-term options and simultaneously buying longer-term options are complex, but are most attractive in that they have the desirable features of limited risk and large potential profits.

CHAPTER 25

Long-Term Option Strategies

Long-term option strategies are very similar to those involving short-term options, but there *are* some nuances. Listed long-term options are actually a slightly different class of options called LEAPS. While that term still exists, it is somewhat outmoded. Rather, in the modern vernacular, long-term options are just referred to by their month and year. For example, in the year 2012, one might refer to an "IBM Jan '14 call"—one expiring in January 2014.

LEAPS options were first introduced by the CBOE in October 1990, and were offered on a handful of blue-chip stocks. They proved quite popular, and eventually long-term options were listed on more stocks. Today, they exist on many stocks and indices with listed options. Prior to the Options Symbol Initiative (OSI) (see Chapter 1), an entirely different set of symbols was required to describe them. But once the OSI came into effect in 2010, the term LEAPS was no longer mandatory.

Strategies involving long-term options are not substantially different from those involving shorter-term options. However, the fact that the option has so much time remaining seems to favor the buyer and be a detriment to the seller. This is one reason why LEAPS have been popular. As a strategist, one knows that the length of time remaining has little to do with whether a certain strategy makes sense or not. Rather, it is the relative value of the option that dictates strategy. If an option is overpriced, it is a viable candidate for selling, whether it has two years of life remaining or two months. Obviously, follow-up action may become much more of a necessity during the life of a two-year option; that matter is discussed later in this chapter.

Long-term options are generally listed about 2.5 years before they expire. For example, in the fall of 2011, long-term options expiring in January of 2014 were listed on most stocks. These listings used to occur in the spring, meaning that the longest-term options had about 2.75 years until expiration, but in 2008, the listed period was shortened. For long-term *stock* options, the only expiration month is January. However, for some index options, long-term options expire in December instead. The details stated above in this paragraph could easily change in the future.

PRICING LEAPS

The factors influencing the prices of LEAPS are the same as those for any other option:

1. underlying stock price,
2. striking price,
3. time remaining,
4. volatility,
5. risk-free interest rate, and
6. dividend rate.

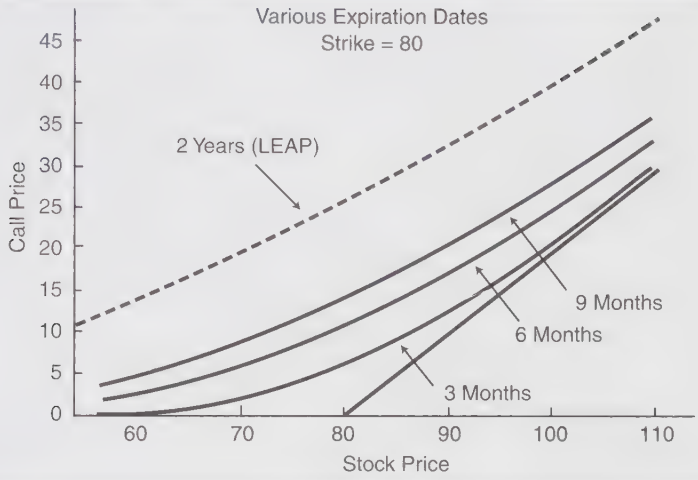
The relative influence of these factors may be a little more pronounced for LEAPS than it is for shorter-term equity options. Consequently, the trader may think that a LEAPS is overly expensive or cheap by inspection, when in reality it is not. *One should be careful in his evaluation of LEAPS until he has acquired experience in observing how their prices relate to the shorter-term equity options with which he is experienced.*

It might prove useful to reexamine the option pricing curve with some LEAPS included. Please refer to Figure 25-1 for the pricing curves of several options. As always, the solid intrinsic value line is the bottom line; it is the same for any call option. The curves are all drawn with the same values for the pertinent variables: stock price, striking price, volatility, short-term interest rate, and dividends. Thus, they can be compared directly.

The most obvious thing to notice about the curves in Figure 25-1 is that the curve depicting the 2-year LEAPS is quite flat. It has the *general* shape of the shorter-term curves, but there is so much time value at stock prices even 25% in- or out-of-the-money, that the 2-year curve is much flatter than the others.

Other observations can be made as well. Notice the at-the-money options: The 2-year LEAPS sells for a little more than four times the 3-month option. As we shall see,

FIGURE 25-1.
Call option pricing curve.



this can change with the effects of interest rates and dividends, but it confirms something that was demonstrated earlier: Time decay is not linear. Thus, the 2-year LEAPS, which has eight times the amount of time remaining as compared to the 3-month call, only sells for about four times as much. This LEAPS might appear cheap to the casual observer, but remember that these graphs depict the fair values for this set of input parameters. *Do not be deluded into thinking that a LEAPS looks cheap merely by comparing its price to a nearer-term option; use a model to evaluate it*, or at least use the output of someone else's model.

The curves in Figure 25-1 depict the relationships between stock price, striking price, and time remaining. The most important remaining determinant of an option's price is the volatility of the underlying stock. Changes in volatility can greatly change the price of any option. This is especially true for LEAPS, since a long-term option's price will fluctuate greatly when volatility changes only a little. Some observations on the differing effects that volatility changes have on short- and long-term options are presented later.

Before that discussion, however, it may be beneficial to examine the effects that interest rates and dividends can have on LEAPS. These effects are much, much greater than those on conventional equity options. Recall that it was stated that interest rates and dividends are minor determinants in the price of an option, unless the dividends were large. That statement pertains mostly to short-term options. For longer-term options, the cumulative effect of an interest rate or dividend over such a long period of time can have a magnified effect in terms of the absolute price of the option.

FIGURE 25-2.
2-year call pricing curve, interest rate comparison.

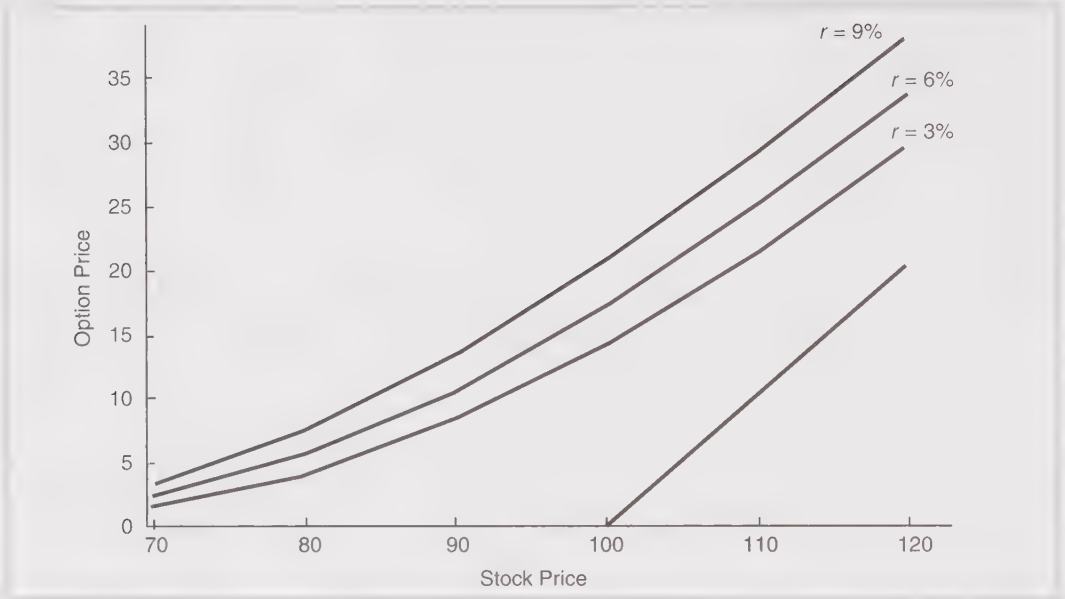
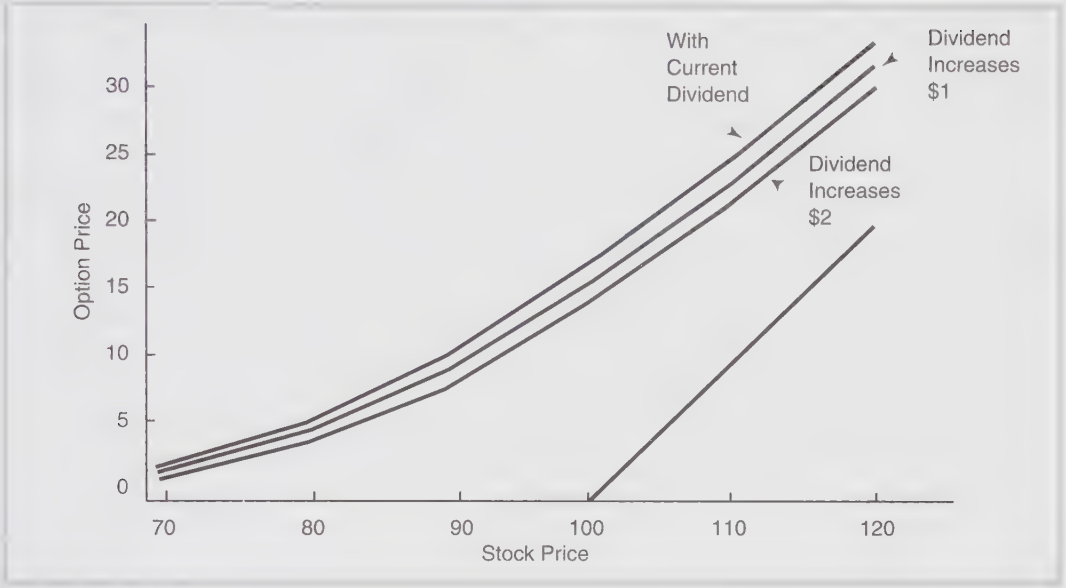


Figure 25-2 presents the option pricing curve again, but the only option depicted is a 2-year call option. The striking price is 100, and the straight line at the right depicts the intrinsic value. The three curves represent option prices for risk-free interest rate of 3%, 6%, and 9%. All other factors (time to expiration, volatility, and dividends) are fixed. The difference between option prices caused merely by a shift in rates of 3% is very large.

The difference in LEAPS prices increases as the LEAPS becomes in-the-money. Note that in this figure, the distance between the curves gets wider as one scans them from left to right. The price difference for *out-of-the-money* LEAPS is large enough—nearly a point even for options fairly far out-of-the-money (that is, the points on the left-hand side of the graph). A shift of 3% in rates causes a larger price difference of over 2 points in the *at-the-money*, 2-year LEAPS. The largest differential in option prices occurs *in-the-money!* This may seem somewhat illogical, but when LEAPS strategies are examined later, the reasons for this will become clear. Suffice it to say that the in-the-money LEAPS are changed in price by over 4 points when rates change by 3%. That is a monstrous differential and should cause any trader who is considering trading in-the-money LEAPS to consider what his outlook is for short-term interest rates.

There is always a substantial probability that rates can change by 3% in two years. Thus, it is difficult to predict with any certainty what risk-free rate to use in the pricing of

FIGURE 25-3.
Long-term call pricing curve as dividends increase.



two-year LEAPS. Moreover, one should be very careful when deciding LEAPS are "cheap" or "expensive" because, conventionally, the short-term interest rate is not usually considered as a significant factor in making such an analysis. For LEAPS, however, Figure 25-2 is obvious proof that interest rate considerations are importants.

Now consider dividends. Figure 25-3 depicts the prices of two-year calls. The three curves on the graph are for different dividend rates—the top line representing the current rate, the middle line representing prices if the dividend were raised by $1 annually, and the bottom line showing what prices would be if the dividend were raised by $2 annually. All other factors (volatility, time remaining, and risk-free interest rates) are the same for each curve in this graph. The increase in dividends manifests itself by decreasing the LEAPS call price. The reason that this is true, of course, is that the stock will be reduced in price more when it goes ex-dividend by the larger amounts of the increased dividends.

The actual amount that the calls lose in price increases slightly as the call is more in-the-money. That is, the curves are closer together on the left-hand (out-of-the-money) side than they are on the right-hand (in-the-money) side. For the in-the-money call, a $1 increase in dividends over two years can cause the LEAPS to be worth about 1½ points less in value.

Figure 25-3 is to the same scale as Figure 25-2, so they can be compared directly in terms of magnitude. Notice that the effect of a $1 increase in dividends on the call

prices is much smaller than that of an increase in interest rates by 3%. Graphically speaking, one can observe this by noting that the spaces between the three curves in the previous figure are much wider than the spaces between the three curves in this figure.

Finally, note that dividend increases have the opposite effect on puts. That is, an increase in the dividend payout of the underlying common will cause a put to *increase* in price. If the put is a long-term put, then the effect of the increase will be even larger.

Lest one think that LEAPS are too difficult to price objectively, note the following. The prior figures of interest rate and dividend effects tend to magnify the effects on prices for two reasons. First, they depict the effects on 2-year LEAPS. That is a large amount of life. The effects would be diminished somewhat for options with 10 to 23 months of life left. Second, the figures depict the change in rates or dividends as being instantaneous. This is not completely realistic. If rates change, they will change by a little bit at a time, usually ¼% or ½% at a time, perhaps as much as 1%. If dividends are increased, that increase may be instantaneous, but it will not likely occur immediately after the LEAPS are purchased or sold. However, the point that these figures are meant to convey is that interest rates and dividends have a much greater effect on LEAPS than on ordinary shorter-term equity options, and that is certainly a true statement.

COMPARING LEAPS AND SHORT-TERM OPTIONS

Table 25-1 will help to illustrate the problem in valuing LEAPS, either mentally or with a model. All of the variables—stock price, volatility, interest rates, and dividends—are given in increments and the comparison is shown between 3-month equity options and 2-year LEAPS. There are three sets of comparisons: for options 20% out-of-the-money, options at-the-money, and options 20% in-the-money.

TABLE 25-1.
Comparing LEAPS and Short-Term Calls.

		Change in Price of the Options					
		20% out		at		20% in	
Variable	Increment	3-mo.	2-yr.	3-mo.	2-yr.	3-mo.	2-yr.
Stock Prc.	+ 1pt	.03	.41	.54	.70	.97	.89
Volatility	+ 1%	.03	.43	.21	.48	.04	.33
Int. Rate	+ ½%	.01	.27	.08	.55	.14	.72
Dividend	+ $.25/qtr	0	–.62	–.08	–1.18	–.14	–1.50

A few words are needed here to explain how volatility is shown in this table. Volatility is normally expressed as a percent. The volatility of the stock market is about 15%. The table shows what would happen if volatility changed by one percentage point, to 16%, for example. Of course, the table also shows what would happen if the other factors changed by a small amount.

Most of the discrepancies between the 3-month and the 2-year options are large. For example, if volatility increases by one percentage point, the 3-month out-of-the-money call will increase in price by only 3 cents (0.03 in the left-hand column) while the 2-year LEAPS call will increase by 43 cents. As another example, look at the bottom right-hand pair of numbers, which show the effect of a dividend increase on the options that are 20% in-the-money. The assumption is that the dividend will increase 25 cents this quarter (and will be 25 cents higher every quarter thereafter). This translates into a loss of 14 cents for the 3-month call, since there is only one ex-dividend period that affects this call; but it translates into a loss of 1½ for the 2-year LEAPS, since the stock will go ex-dividend by an extra $2 over the life of that call.

The table also shows that only three of the discrepancies are not large. Two involve the stock price change. If the stock changes in price by 1 point, neither the at-the-money nor the in-the-money options behave very differently, although the at-the-money LEAPS do jump by 70 cents. The observant reader will notice that the top line of the table depicts the *delta* of the options in question; it shows the change in option price for a one-point change in stock price. The only other comparison that is not extremely divergent is that of volatility change for the at-the-money option. The 3-month call changes by 21 cents while the LEAPS changes by nearly ½ point. This is still a factor of two-to-one, but is much less than the other comparisons in the table.

Study the other comparisons in the table. The trader who is used to dealing with short-term options might ordinarily ignore the effect of a rise in interest rates of ½ of 1%, of a 25-cent increase in the quarterly dividend, of the volatility increasing by a mere 1%, or maybe even of the stock moving by one point (only if his option is out-of-the-money). The LEAPS option trader will gain or suffer substantially and immediately if any of these occur. In almost every case, his LEAPS call will gain or lose ½ point of value—a significant amount, to be sure.

LEAPS STRATEGIES

Many of the strategies involving LEAPS are not significantly different from their counterparts that involve short-term options. However, as shown earlier, the long-term nature of the LEAPS can sometimes cause the strategist to experience a result different from that to which he has become accustomed.

As a general rule, one would want to be a buyer of LEAPS when interest rates were low and when the volatilities being implied in the marketplace are low. If the opposite were true (high rates and high volatilities), he would lean toward strategies in which the sale of LEAPS is used. Of course, there are many other specific considerations when it comes to operating a strategy, but since the long-term nature of LEAPS exposes one to interest rate and volatility movements for such a long time, one may as well attempt to position himself favorably with respect to those two elements when he enters a position.

LEAPS AS STOCK SUBSTITUTE

Any in-the-money option can be used as a substitute for the underlying stock. Stock owners may be able to substitute a long in-the-money call for their long stock. Short sellers of stock may be able to substitute a long put for their short stock. This is not a new idea; it was discussed briefly in Chapter 3 under reasons why people buy calls. It has been available as a strategy for some time with short-term options. Its attractiveness seems to have increased somewhat with the introduction of LEAPS, however. More and more people are examining the potential of selling the stock they own and buying long-term calls (LEAPS) as a substitute, or buying LEAPS instead of making an initial purchase in a particular common stock.

Substitution for Stock Currently Held Long. Simplistically, this strategy involves this line of thinking: If one owns stock and sells it, an investor could reinvest a small portion of the proceeds in a call option, thereby providing continued upside profit potential if the stock rises in price, and invest the rest in a bank to earn interest. The interest earned would act as a substitute for the dividend, if any, to which the investor is no longer entitled. Moreover, he has less downside risk: If the stock should fall dramatically, his loss is limited to the initial cost of the call.

In actual practice, one should carefully calculate what he is getting and what he is giving up. For example, is the loss of the dividend too great to be compensated for by the investment of the excess proceeds? How much of the potential gain will be wasted in the form of time value premium paid for the call? The costs to the stock owner who decides to switch into call options as a substitute are commissions, the time value premium of the call, and the loss of dividends. The benefits are the interest that can be earned from freeing up a substantial portion of his funds, plus the fact that there is less downside risk in owning the call than in owning the stock.

Example: XYZ is selling at 50. There are one-year LEAPS with a striking price of 40 that sell for $12. XYZ pays an annual dividend of $0.50 and short-term interest rates are 5%. What are the economics that an owner of 100 XYZ common stock must calculate in

order to determine whether it is viable to sell his stock and buy the one-year LEAPS as a substitute?

The call has time value premium of 2 points (40 + 12 – 50). Moreover, if the stock is sold and the LEAPS purchased, a credit of $3,800 less commissions would be generated. First, calculate the net credit generated:

Credit balance generated:		
Sale of 100 XYZ stock	$5,000	
Less stock commission	– 25	
Net sale proceeds:	$4,975 credit	
Cost of one LEAPS call		$1,200
Plus option commission		15
Net cost of call:		$1,215 debit
Total credit balance:	$3,760 credit	

Now the costs and benefits of making the switch can be computed:

Costs of switching:	
Time value premium	– $200
Loss of dividend	– $ 50
Stock commissions	– $ 25
Option commissions	– $ 15
Total cost:	– $290
Fixed benefit from switching:	
Interest earned on credit balance of $3,760 at 5% interest for one year = 0.05 × $3,760;	+ $188
Net cost of switching:	– $102

The stock owner must now decide if it is worth just over $1 per share in order to have his downside risk limited to a price of 39½ over the next year. The price of 39½ as his downside risk is merely the amount of the net credit he received from doing the switch ($3,760) plus the interest earned ($188), expressed in per-share terms. That is, if XYZ falls dramatically over the next year and the LEAPS expires worthless, this investor will still

have $3,948 in a bank account. That is equivalent to limiting his risk to about 39½ on the original 100 shares.

If the investor decides to make the substitution, he should invest the proceeds from the sale in a 1-year CD or Treasury bill, for two reasons. First, he locks in the current rate—the one used in his calculations—for the year. Second, he is not tempted to use the money for something else, an action that might negate the potential benefits of the substitution.

The above calculations all assume that the LEAPS call or the stock would have been held for the full year. If that is known not to be the case, the appropriate costs or benefits must be recalculated.

Caveats. This ($102) seems like a reasonably small price to pay to make the switch from common stock to call ownership. However, if the investor were planning to sell the stock before it fell to 39½ in any case, he might not feel the need to pay for this protection. (Be aware, however, that he could accomplish essentially the same thing, since he can sell his LEAPS call whenever he wants to.) Moreover, when the year is up, he will have to pay another stock commission to repurchase his XYZ common if he still wants to own it (or he will have to pay two option commission to roll his long call out to a later expiration date). One other detriment that might exist, although a relatively unlikely one, is that the underlying common might declare an increased dividend or, even worse, a special cash dividend. The LEAPS call owner would not be entitled to that dividend increase in whatever form, while, obviously, the common stock owner would have been. If the company declared a stock dividend, it would have no effect on this strategy since the call owner is entitled to those. A change in interest rates is not a factor either, since the owner of the LEAPS should invest in a 1-year Treasury bill or a 1-year CD and therefore would not be subject to interim changes in short-term interest rates.

There may be other mitigating circumstances. Mostly these would involve tax considerations. If the stock is currently a profitable investment, the sale would generate a capital gain, and taxes might be owed. If the stock is currently being held at a loss, the purchase of the call would constitute a wash sale and the loss could not be taken at this time. (See Chapter 41 on taxes for a broader discussion of the wash sale rule and option trading.)

In theory, the calculations above could produce an overall credit, in which case the stockholder would normally want to substitute with the call, unless he has overriding tax considerations or suspects that a cash dividend increase is going to be announced. *Be very careful about switching if this situation should arise.* Normally, arbitrageurs—persons trading for exchange members and paying no commission—would take advantage of such a situation before the general public could. If they are letting the opportunity pass by, there must be a reason (probably the cash dividend), so be extremely certain of your economics and research before venturing into such a situation.

In summary, holders of common stock on which there exist in-the-money LEAPS should evaluate the economics of substituting the LEAPS call for the common stock. Even if arithmetic calculations call for the substitution, the stockholder should consider his tax situation as well as his outlook for the cash dividends to be paid by the common before making the switch.

BUYING LEAPS AS THE INITIAL PURCHASE INSTEAD OF BUYING A COMMON STOCK

Logic similar to that used earlier to determine whether a stockholder might want to substitute a LEAPS call for his stock can be used by a prospective purchaser of common stock. In other words, this investor does not already own the common. He is going to buy it. This prospective purchaser might want to buy a LEAPS call and put the rest of the money he had planned to use in the bank, instead of actually buying the stock itself.

His costs—real and opportunity—are calculated in a similar manner to those expressed earlier. The only real difference is that he has to spend the stock commission in this case, whereas he did not in the previous example (since he already owned the stock).

Example: As before, XYZ is selling at 50; there are 1-year LEAPS with a striking price of 40 that sell for $12; XYZ pays an annual dividend of $0.50, and short-term interest rates are 5%.

The *initial* purchaser of common stock would have certain "opportunity" costs and savings if he decided instead to buy the LEAPS calls. First, calculate the difference in investment required for the stock versus the LEAPS:

Prospective initial investment:		
Stock: $5,000 + $25 commision	=	$5,025
LEAPS: $1,200 + $15 commision	=	$1,215
Net difference:		$3,810

Now calculate the costs versus the savings:

Costs:	
Time value premium	−$200
Loss of dividend	−$ 50
Savings:	
Interest on $3,810 for one year at 5%:	+$190
Net opportunity cost:	−$ 60

In this case, it seems even more likely that the prospective stock purchaser would instead buy the LEAPS call. His net "cost" of doing so, provided he puts the difference in initial investment in a 1-year CD or Treasury bill, is only $60. For this small amount, he has all the upside appreciation (except $60 worth), but has risk only down to 40 (he will have $4,000 in his bank account at the end of one year even if the LEAPS expire worthless).

This strategy of buying in-the-money LEAPS and putting the difference between the LEAPS cost and the stock cost in an interest-bearing instrument is an attractive one. It might seem it would be especially attractive if interest rates for the differential were high. Unfortunately, those high rates would present something of a catch-22 because, as was shown earlier, higher rates will cause the LEAPS to be more expensive.

In this margin strategy, one has the risk of not participating in cash dividend increases or specials as the stockholder who substitutes does. But the other concerns of the stockholder, such as taxes, are not pertinent here. Again, these specific calculations only apply if the stock were to be held for the entire year. Adjustments would have to be made if the holding period envisioned is shorter.

Using Margin. The same prospective initial purchaser of common stock might have been contemplating the purchase of the stock on margin. If he used the LEAPS instead, he could save the margin interest. Of course, he wouldn't have as much money to put in the bank, but he should also compare his costs against those of buying the LEAPS call instead.

Example: As before, XYZ is selling at 50; there are 1-year LEAPS with a striking price of 40 that sell for $12; XYZ pays an annual dividend of $0.50; and short-term interest rates are 5%. Furthermore, assume the margin rate is 8% on borrowed debit balances.

First, calculate the difference in prospective investments:

Cost of buying the stock:	
$5,000 + $25 commission:	$5,025
Amount borrowed (50%)	–2,512
Equity required	$2,513
Cost of buying LEAPS:	
$1,200 + $15 commission:	$1,215
Difference (available to be placed in bank account)	$1,298

Now the costs and opportunities can be compared, if it is assumed that he buys the LEAPS:

Costs:	
Time value premium	–$200
Dividend loss	– 50
Savings:	
Interest on $1,298 at 5%	+$ 65
Margin interest on $2,512 debit balance at 8% for one year	+ 201
Net Savings:	+$ 16

For the prospective margin buyer, there is a real savings in this example. The fact that he does not have to pay the margin interest on his debit balance makes the purchase of the LEAPS call a cost-saving alternative. Finally, it should be noted that current margin rules allow one to purchase a LEAPS option on margin. That can be accounted for in the above calculations as well; merely reduce the investment required and increase the margin charges on the debit balance.

In summary, a prospective purchaser of common stock may often find that if there is an in-the-money option available, the purchase of that option is more attractive than buying the common stock itself. If he were planning to buy on margin, it is even more likely that the LEAPS purchase will be attractive. The main drawback is that he will not participate if cash dividends are increased or a special dividend is declared. Read on, however, because the next strategy may be better than the one above.

PROTECTING EXISTING STOCK HOLDINGS WITH LEAPS PUTS

What was accomplished in the substitution strategy previously discussed? The stock owner paid some cost ($102 in the actual example) in order to limit the risk of his stock ownership to a price of 39½. What if he had bought a LEAPS put instead? Forgetting the price of the put for a moment, concentrate on what the strategy would accomplish. He would be protected from a large loss on the downside since he owns the put, and he could participate in upside appreciation since he still owns the stock. Isn't this what the substitution strategy was trying to accomplish? *Yes, it is.* In this strategy, only one commission is paid—that being on a fairly cheap out-of-the-money LEAPS put—and there is no risk of losing out on dividend increases or special dividends.

The comparison between substituting a call or buying a put is a relatively simple one. First, do the calculations as they were performed in the initial example above. That

example showed that the stockholder's cost would be $102 to substitute the LEAPS call for the stock, and such a substitution would protect him at a price of 39½. In effect, he is paying $152 for a LEAPS put with a strike of 40—the $102 cost plus the difference between 40 and the 39½ protection price. Now, if an XYZ 1-year LEAPS put with strike 40 were available at 1½, he could accomplish everything he had initially wanted merely by buying the put.

Moreover, he would save commissions and still be in a position to participate in increased cash dividends. These additional benefits should make the put worth even more to the stockholder, so that he might pay even slightly more than 1½ for the put. If the LEAPS put were available at this price, it would clearly be the better choice and should be bought instead of substituting the LEAPS call for the common stock.

Thus, any stockholder who is thinking of protecting his position can do it in one of two ways: Sell the stock and substitute a call, or continue to hold his stock and buy a put to protect it. LEAPS calls and puts are amenable to this strategy. Because of the LEAPS' long-term nature, one does not have to keep reestablishing his position and pay numerous commissions, as he would with short-term options. The stockholder should perform the simple calculations as shown above in order to decide whether the move is feasible at all, and if it is, whether to use the call substitution strategy or the put protection strategy.

LEAPS INSTEAD OF SHORT STOCK

Just as in-the-money LEAPS calls may sometimes be a smarter purchase than the stock itself, in-the-money puts may sometimes be a better purchase than *shorting* the common stock. Recall that either the put purchase or the short sale of stock is a bearish strategy, generally implemented by someone who expects the stock to decline in price. The strategist knows, however, that short stock is a component of many strategies and might reflect other opinions than pure bearishness on the common. In any case, an in-the-money put may prove to be a viable substitute for shorting the stock itself. The two main advantages that the put owner has are that he has limited risk (whereas the short seller of stock has theoretically unlimited risk); and he does not have to pay out any dividends on the underlying stock as the short seller would. Also, the commissions for buying the put would normally be smaller than those required to sell the stock short.

There is not much in the way of calculating that needs to be done in order to make the comparison between buying the in-the-money put and shorting the stock. If the time value premium spent is small in comparison with the dividend payout that is saved, then the put is probably the better choice.

Professional arbitrageurs and other exchange members, as well as some large customers, receive interest on their short sales. For these traders, the put would have to be trading with virtually no time premium at all in order for the comparison to favor the put

purchase over the stock short sale. However, the public customer who is going to be shorting stock should be aware of the potential for buying an in-the-money put instead.

SPECULATIVE OPTION BUYING WITH LEAPS

Strategists know that buying calls and puts can have various applications; witness the stock substitution strategies above. However, the most popular reason for buying options is for speculative gain. The leverage inherent in owning options and their limited risk feature make them attractive for this purpose as well. The risk, of course, can be 100% of the investment, and time decay works against the option owner as well. LEAPS calls and puts fit all of these descriptions; they simply have longer maturities.

Time decay is the major enemy of the speculative option holder. Purchasing LEAPS options instead of the shorter-term equity options generally exposes the buyer to less risk of time decay on a daily basis. This is true because the extreme negative effects of time decay magnify as the option approaches its expiration. Recall that it was shown in Chapter 3 that time decay is not linear: An option decays more rapidly at the end of its life than at the beginning. Eventually, a LEAPS put or call will become a normal short-term equity option and time will begin to take a more rapid toll. But in the beginning of the life of LEAPS, there is so much time remaining that the short-term decay is not large in terms of price.

Table 25-2 and Figure 25-4 depict the rate of decay of two options: one is at-the-money (the lower curve) and the other is 20% out-of-the-money (the upper curve). The horizontal axis is months of life remaining until expiration. The vertical axis is the percent of the option price that is lost *daily* due to time decay. The options that qualify as LEAPS are ones with more than 9 months of life remaining, and would thus be the ones on the lower right-hand part of the graph.

The upward-sloping nature of both curves as time to expiration wanes shows that time decay increases more rapidly as expiration approaches. Notice how much more rapidly the out-of-the-money option decays, percentagewise, than the at-the-money. LEAPS, however, do not decay much at all compared to normal equity options. Most LEAPS, even the out-of-the-money ones, lose less than ¼ of one percent of their value daily. This is a pittance when compared with a 6-month equity option that is 20% out-of-the-money—that option loses well over 1% of its value daily and it still has 6 months of life remaining.

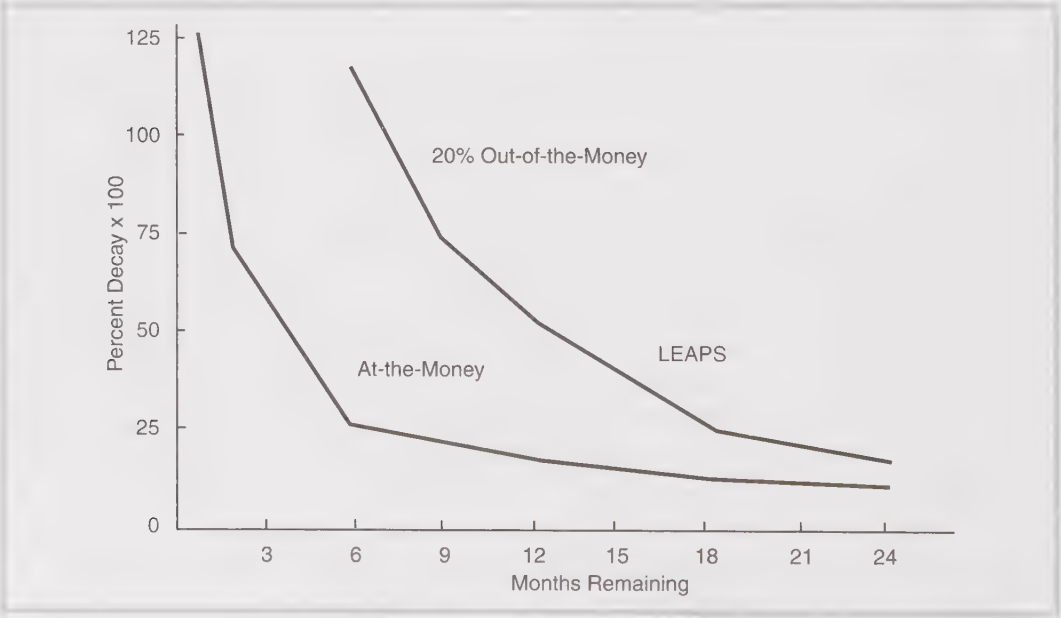
From the accompanying table, observe that the out-of-the-money 2-month option loses over 4% of its value daily!

Thus, LEAPS do not decay at a rapid rate. This gives the LEAPS holder a chance to have his opinion about the stock price work for him without having to worry as much

TABLE 25-2.
Daily percent time value decay.

	Percent Decay	
Months remaining	At-the-money	20% Out-of-the-money
24	.12	.18
18	.14	.27
12	.19	.55
9	.22	.76
6	.27	1.18
3	.60	3.57
2	.73	4.43
1	1.27	
2 wks	3.33	

FIGURE 25-4.
Daily percent time value decay.



about the passage of time as the average equity option holder would. An advantage of owning LEAPS, therefore, is that one's timing of the option purchase does not have to be as exact as that for shorter-term option buying. This can be a great psychological advantage as well as a strategic advantage. The LEAPS option buyer who feels strongly that the stock will move in the desired direction has the luxury of being able to wait calmly for the anticipated move to take place. If it does not, even in perhaps as long as 6 months' time, he may still be able to recoup a reasonable portion of his initial purchase price because of the slow percentage rate of decay.

Do not be deluded into believing that LEAPS don't decay at all. Although the *rate* of decay is slow (as shown previously), an option that is losing 0.15% of its value daily will still lose about 25% of its value in six months.

Example: XYZ is at 60 and there are 18-month LEAPS calls selling for $8, with a striking price of 60. The daily decay of this call with respect to time will be minuscule; it will take about a week for even an eighth of a point to be lost due to time. However, if the option is held for six months and nothing else happens, the LEAPS call will be selling for about 6. Thus, it will have lost 25% of its value if the stock remains around 60 at the end of six months.

Those familiar with holding equity calls and puts are more accustomed to seeing an option lose 25% of its value in possibly as little as four or five weeks' time. Thus, the advantage of holding the LEAPS is obvious from the viewpoint of slower time decay.

This observation leads to the obvious question: "When is the best time to sell my call and repurchase a longer-term one?" Referring again to Figure 25-4 may help answer the question. Note that for the at-the-money option, the curve begins to bend dramatically upward soon after the 6-month time barrier is passed. Thus, it seems logical that to minimize the effects of time decay, all other things being equal, one would sell his long at-the-money call when it has about 6 months of life left and simultaneously buy a 2-year LEAPS call. This keeps his time decay exposure to a minimum.

The out-of-the-money call is more radical. Figure 25-4 shows that the call that is 20% out-of-the-money begins to decay much more rapidly (percentagewise) at sometime just before it reaches one year until expiration. The same logic would dictate, then, that if one is trading out-of-the-money options, he would sell his option held long when it has about one year to go and reestablish his position by buying a 2-year LEAPS option at the same time.

ADVANTAGES OF BUYING "CHEAP"

It has been demonstrated that rising interest rates or rising volatility would make the price of a LEAPS call increase. Therefore, if one is attempting to participate in LEAPS

speculative call buying strategies, he should be more aggressive when rates and volatilities are low.

A few sample prices may help to demonstrate just how powerful the effects of rates and volatilities are, and how they can be a friend to the LEAPS call buyer. Suppose that one buys a 2-year LEAPS call at-the-money when the following situation exists:

XYZ: 100
January 2-year LEAPS call with strike of 100: 14
Short-term interest rates: 3%
Volatility: below average (historically)

For the purposes of demonstration, suppose that the current volatility is low for XYZ (historically) and that 3% is a low level for rates as well. If the stock moves up, there is no problem, because the LEAPS call will increase in price. But what if the stock drops or stays unchanged? Is all hope of a profit lost? Actually, no. If interest rates increase or the volatility that the calls trade at increases, we know the LEAPS call will increase in value as well. Thus, even though the direction in which the stock is moving may be unfavorable, it might still be possible to salvage one's investment. Table 25-3 shows where volatility would have to be or where short-term rates would have to go in order to keep the value of the LEAPS call at 14 even after the indicated amount of time had expired.

To demonstrate the use of this table, suppose the stock price were 100 (unchanged) after one month. If interest rates had risen to 3.4% from their original level of 3% during that time, the call would still be worth 14 even though one month had passed. Alternatively, if rates were the same, but volatility had increased by only 5% from its original level, then the call would also still be worth 14. Note that this means that volatility would have to increase only slightly (by 1/20th) from its original level, not by 5 percentage points.

TABLE 25-3.
Factors necessary for January 2-year LEAPS to be = 14.

Stock price	After 1 month	After 6 months
100 (unchanged)	r = 3.4% or	r = 6% or
	v + 5%	v + 20%
95	r = 6% or	r = 9.4% or
	v + 20%	v + 45%
90	r = 8.5% or	r = 12.6% or
	v + 45%	v + 70%

Even if the stock were to drop to 90 and six months had passed, the LEAPS call holder would still be even if rates had risen to 12.6% (highly unlikely) or volatility had risen by 70%. It is often possible for volatilities to fluctuate to that extent in six months, but not likely for interest rates.

In fact, as interest rates go, only the top line of the table probably represents realistic interest rates; an increase of 0.4% in one month, or 3% in 6 months, is possible. The other lines, where the stock drops in price, probably require too large a jump in rates for rates alone to be able to salvage the call price. However, any increase in rates will be helpful. Volatility is another matter. It is often feasible for volatilities to change by as much as 50% from their previous level in a month, and certainly in six months. Hence, as has been stated before, the volatility factor is the more dominant one.

This table shows the effect of rising interest rates and volatilities on LEAPS calls. It would be beneficial to the LEAPS call owner and, of course, detrimental to the LEAPS call seller. This is clear evidence that one should be aware of the general level of rates and volatility before using LEAPS options in a strategy.

THE DELTA

The delta of an option is the amount by which the option price will change if the underlying stock changes in price by one point. In an earlier section of this chapter, comparing the differences between LEAPS and short-term calls, mention was made of delta. The subject is explored in more depth here because it is such an important concept, not only for option buyers, but for most strategic decisions as well.

Figure 25-5 depicts the deltas of two different options: 2-year LEAPS and 3-month equity options. Their terms are the same except for their expiration dates; striking price is 100, and volatility and interest rate assumptions are equal. The horizontal axis displays the stock price while the vertical axis shows the delta of the options.

Several relevant observations can be made. First, notice that the delta of the at-the-money LEAPS is very large, nearly 0.70. This means that the LEAPS call will move much more in line with the common stock than a comparable short-term equity option would. Very short-term at-the-money options have deltas of about ½, while slightly longer-term ones have deltas ranging up to the 0.55 to 0.60 area. *What this implies is that the longer the life of an at-the-money option, the greater its delta.*

In addition, the figure shows that the deltas of the 3-month call and the 2-year LEAPS call are about equal when the options are approximately 5% in-the-money. If the options are more in-the-money than that, then the LEAPS call has a lower delta. This means that at- and out-of-the-money LEAPS will move more in line with the common stock than comparable short-term options will. Restated, the LEAPS calls will move

FIGURE 25-5.
Call delta comparison, 2-year LEAPS versus 3-month equity options.

faster than the ordinary short-term equity calls unless both options are more than 5% in-the-money. Note that the movement referred to is in absolute terms in change of price, not in percentage terms.

The delta of the 2-year LEAPS does not change as dramatically when the stock moves as does the delta of the 3-month option (see Figure 25-5). Notice that the LEAPS curve is relatively flat on the chart, rising only slightly above horizontal. In contrast, the delta of the 3-month call is very low out-of-the-money and very large in-the-money. What this means to the call buyer is that the amount by which he can expect the LEAPS call to increase or decrease in price is somewhat stable. This can affect his choice of whether to buy the in-the-money call or the out-of-the-money call. With normal short-term options, he can expect the in-the-money call to much more closely mirror the movement in the stock, so he might be tempted to buy that call if he expects a small movement in the stock. With LEAPS, however, there is much less discrepancy in the amount of option price movement that will occur.

Example: XYZ is trading at 82. There are 3-month calls with strikes of 80 and 90, and there are 2-year LEAPS calls at those strikes as well. The following table summarizes the available information:

XYZ: 82 Date: January, 2002		
Option	Price	Delta
April ('02) 80 call	4	⅝
April ('02) 90 call	1	⅛
January ('04) 80 LEAPS call	14	¾
January ('04) 90 LEAPS call	7	½

Suppose the trader expects a 3-point move by the underlying common stock, from 82 to 85. If he were analyzing short-term calls, he would see his potential as a gain of 1⅞ in the April 80 call versus a gain of ⅜ in the April 90 call. Each of these gains is projected by multiplying the call's delta times 3 (the expected stock move, in points). Thus, there is a large difference between the expected gains from these two options, particularly after commissions are considered.

Now observe the LEAPS. The January 80 would increase by 2¼ while the January 90 would increase by 1½ if XYZ moved higher by 3 points. This is not nearly as large a discrepancy as the short-term options had. Observe that the January 90 LEAPS sells for half the price of the January 80. These movements projected by the delta indicate that the January 90 LEAPS will move by a larger *percentage* than the January 80 and therefore would be the better buy.

PUT DELTAS

Many of the previous observations regarding deltas of LEAPS calls can be applied to LEAPS puts as well. However, Figure 25-5 changes a little when the following formula is applied. Recall that the relationship between put deltas and call deltas, except for deeply in-the-money puts, is:

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

This has the effect of *inverting* the relationships that have just been described. In other words, while the short-term calls didn't move as fast as the LEAPS, the *short-term puts move faster than the LEAPS puts in most cases.* Figure 25-6 shows the deltas of these options.

The vertical axis shows the puts' delta. Notice that out-of-the-money LEAPS puts and short-term equity puts don't behave very differently in terms of price change (bottom right-hand section of figure).

FIGURE 25-6.
Put delta comparison, 2-year LEAPS versus 3-month equity options.

In-the-money puts (when the stock is below the striking price) move faster if they are shorter-term. This fact is accentuated even more when the puts are more deeply in-the-money. The left-hand side of the figure depicts this fact.

The LEAPS put delta curve is flat, just as the call delta curve was. Moreover, the delta is not very large anywhere across the figure. For example, at-the-money 2-year LEAPS puts move only about 30 cents for a one-point move in the underlying stock. *LEAPS put buyers who want to speculate on a stock's downward movement must realize that the leverage factor is not large;* it takes approximately a 3-point move by the underlying common for an at-the-money LEAPS put to increase in value by one point. Long-term puts don't mirror stock movement nearly as well as shorter-term puts do.

In summary, the option buyer who is considering buying LEAPS puts or calls as speculation should be aware of the different price action that LEAPS exhibit when compared to shorter-term options. Due to the large amount of time that LEAPS have remaining in their lives, the time decay of the LEAPS options is smaller. For this reason, the LEAPS option buyer doesn't need to be as precise in his timing. In general, LEAPS calls move faster when the underlying stock moves, and LEAPS puts move more slowly. Other than that, the general reasons for speculative option buying apply to LEAPS as well: leverage and limited risk.

SELLING LEAPS

Strategies involving selling LEAPS options do not differ substantially from those involving shorter-term options. The discussions in this section concentrate on the two major differences that sellers of LEAPS will notice. First, the slow rate of time decay of LEAPS options means that option writers who are used to sitting back and watching their written options waste away will not experience the same effect with LEAPS. Second, follow-up action for writing strategies usually depends on being able to buy back the written option when it has little or no time value premium remaining. Since LEAPS retain time value even when substantially in- or out-of-the-money, follow-up action involving LEAPS may involve the repurchase of substantial amounts of time value premium.

COVERED WRITING

LEAPS options can be sold against underlying stock just as short-term options can. No extra collateral or investment is required to do so. The resulting position is again one with limited profit potential, but enhanced profitability (as compared to stock ownership), if the underlying stock remains unchanged or falls. The maximum profit potential of the covered write is reached whenever the underlying stock is at or above the striking price of the written option at expiration.

The LEAPS covered writer takes in substantial premium, in terms of price, when he sells the long-term option. He should compare the return that he could make from the LEAPS write with returns that can be made from repeatedly writing shorter-term calls. Of course, there is no guarantee that he will actually be able to repeat the short-term writes during the longer life of the LEAPS.

As an aside, the strategist who is utilizing the *incremental return* concept of covered writing may find LEAPS call writing quite attractive. This is the strategy wherein he has a higher target price at which he would be willing to sell his common stock, and he writes calls along the way to earn an incremental return (see Chapter 2 for details). Since this type of writer is only concerned with absolute levels of premiums being brought into the account and not with things like return if exercised, he should utilize LEAPS calls if available, since the premiums are the largest available. Moreover, if the incremental return writer is currently in a short-term call and is going to be called away, he might roll into a LEAPS call in order to retain his stock and take in more premium.

The rest of this section discusses covered writing from the more normal viewpoint of the investor who buys stock and sells a call against it in order to attain a particular return.

Example: XYZ is selling at 50. The investor is considering a 500-share covered write and he is unsure whether to use the 6-month call or the 2-year LEAPS. The July 50 call sells

for 4 and has 6 months of life remaining; the January 50 LEAPS call sells for 8½ and has 2 years of life. Further assume that XYZ pays a dividend of $0.25 per quarter.

As was done in Chapter 2, the net required investment is calculated, then the return (if exercised) is computed, and finally the downside break-even point is determined.

Net Investment Required		
	July 50 call	January 50 LEAPS
Stock cost (500 shares @ 50)	$25,000	$25,000
Plus stock commission	+ 300	+ 300
Less option premiums received	– 2,000	– 4,250
Plus option commissions	+ 50	+ 100
Net cash investment	$23,350	$21,150

Obviously, the LEAPS covered writer has a smaller cash investment, since he is selling a more expensive call in his covered write. Note that the option premium is being applied against the net investment in either case, as is the normal custom when doing covered writing.

Now, using the net investment required, one can calculate the return (if exercised). That return assumes the stock is above the striking price of the written option at its expiration, and the stock is called away. The short-term writer would have collected two dividends of the common stock, while the LEAPS writer would have collected eight by expiration.

Return If Exercised		
	July 50 call	January 50 LEAPS
Stock sale (500 @ 50)	$25,000	$25,000
Less stock commission	– 300	– 300
Plus dividends earned until expiration	+ 250	+ 1,000
Less net investment	– 23,350	– 21,150
Net profit if exercised	$ 1,600	$ 4,550
Return if exercised (net profit/net investment)	6.9%	21.5%

The LEAPS writer has a much higher net return if exercised, again because he wrote a more expensive option to begin with. However, in order to fairly compare the two writes, one must annualize the returns. That is, the July 50 covered write made 6.9% in six months, so it could make twice that in one year, *if it can be duplicated six months*

from now. In a similar manner, the LEAPS covered writer can make 21.5% in two years if the stock is called away. However, on an annualized basis, he would make only half that amount.

Return If Exercised, Annualized	
July 50 call	January 50 LEAPS
13.8%	10.8%

Thus, on an annualized basis, the short-term write seems better. The shorter-term call will generally have a higher rate of return, annualized, than the LEAPS call. The problems with annualizing are discussed in the following text.

Finally, the downside break-even point can be computed for each write.

Downside Break-Even Calculation		
	July 50 call	January 50 LEAPS
Net investment	$23,350	$21,150
Less dividends received	– 250	– 1,000
Total stock cost to expiration	$23,100	$20,150
Divided by shares held (500), equals break-even price:	46.2	40.3

The larger premium of the LEAPS call that was written produces this dramatically lower break-even price for the LEAPS covered write.

Similar comparisons could be made for a covered write on margin if the investor is using a margin account. The steps above are the mechanical ones that a covered writer should go through in order to see how the short-term write compares to the longer-term LEAPS write. Analyzing them is often a less routine matter. It would seem that the short-term write is better if one uses the *annualized* rate of return. However, the annualized return is a somewhat subjective number that depends on several assumptions.

The first assumption is that one will be able to generate an equivalent return six months from now when the July 50 call expires worthless or the stock is called away. If the stock were relatively unchanged, the covered writer would have to sell a 6-month call for 4 points again six months from now. Or, if the stock were called away, he would have to invest in an equivalent situation elsewhere. Moreover, in order to reach the 2-year horizon offered by the LEAPS write, the 6-month return would have to be regenerated *three* more times (six months from now, one year from now, and a year and a half from

now). The covered writer cannot assume that such returns can be repeated with any certainty every six months.

The second assumption that was made when the annualized returns were calculated was that one-half the return if exercised on the LEAPS call would be made when one year had passed. But, as has been demonstrated repeatedly in this chapter, the time decay of an option is not linear. Therefore, one year from now, if XYZ were still at 50, the January 50 LEAPS call would not be selling for half its current price (½ × 8½ – 4½). It would be selling for something more like 5.00, if all other factors remained unchanged. However, given the variability of LEAPS call premiums when interest rates, volatility, or dividend payouts change, it is extremely difficult to estimate the call price one year from now. Consequently, to say that the 21.5% 2-year return if exercised would be 10.8% after one year may well be a false statement.

Thus, the covered writer must make his decision based on what he knows. He knows that with the short-term July 50 write, if the stock is called away in six months, he will make 6.9%, period. If he opts for the longer term, he will make 21.5% if he is called away in two years. Which is better? The question can only be answered by each covered writer individually. One's attitude toward long-term investing will be a major factor in making the decision. If he thinks XYZ has good prospects for the long term, and he feels conservative returns will be below 10% for the next couple of years, then he would probably choose the LEAPS write. However, if he feels that there is a temporary expansion of option premium in the short-term XYZ calls that should be exploited, and he would not really want to be a long-term holder of the stock, then he would choose the short-term covered write.

Downside Protection. The actual downside break-even point might enter into one's thinking as well. A downside break-even point of 40.3 is available by using the LEAPS write, and that is a known quantity. No matter how far XYZ might fall, as long as it can recover to slightly over 40 by expiration two years from now, the investment will at least break even. A problem arises if XYZ falls to 40 quickly. If that happened, the LEAPS call would still have a significant amount of time value premium remaining on it. Thus, if the investor attempted to sell his stock at that time and buy back his call, he would have a loss, not a break-even situation.

The short-term write offers downside protection only to a stock price of 46.2. Of course, repeated writes of 6-month calls over the next 2 years would lower the break-even point below that level. The problem is that if XYZ declines and one is forced to keep selling 6-month calls every 6 months, he may be forced to use a lower striking price, thereby locking in a smaller profit (or possibly even a loss) if premium levels shrink. The concepts of rolling down are described in detail in Chapter 2.

A further word about rolling down may be in order here. Recall that rolling down means buying back the call that is currently written and selling another one with a lower

striking price. Such action *always* reduces the profitability of the overall position, although it may be necessary to prevent further downside losses if the common stock keeps declining. Now that LEAPS are available, the short-term writer faced with rolling down may look to the LEAPS as a means of bringing in a healthy premium even though he is rolling down. It is true that a large premium could be brought into the account. But remember that by doing so, one is committing himself to sell the stock at a lower price than he had originally intended. This is why the rolling down reduces the original profit potential. *If he rolls down into a LEAPS call, he is reducing his maximum profit potential for a longer period of time.* Consequently, one should not always roll down into an option with a longer maturity. Instead, he should carefully analyze whether he wants to be committed for an even longer time to a position in which the underlying common stock is declining.

To summarize, the large absolute premiums available in LEAPS calls may make a covered write of those calls seem unusually attractive. However, one should calculate the returns available and decide whether a short-term write might not serve his purpose as well. Even though the large LEAPS premium might reduce the initial investment to a mere pittance, be aware that this creates a great amount of leverage, and leverage can be a dangerous thing.

The large amount of downside protection offered by the LEAPS call is real, but if the stock falls quickly, there would definitely be a loss at the calculated downside break-even point. Finally, one cannot always roll down into a LEAPS call if trouble develops, because he will be committing himself for an even longer period of time to sell his stock at a lower price than he had originally intended.

"FREE" COVERED CALL WRITES

In Chapter 2, a strategy of writing expensive LEAPS options was briefly described. In this section, a more detailed analysis is offered. A certain type of covered call write, one in which the call is quite expensive, sometimes attracts traders looking for a "free ride." To a certain extent, this strategy *is* something of a free ride. As you might imagine, though, there can be major problems.

The investment required for a covered call write on margin is 50% of the stock price, less the proceeds received from selling the call. In theory, it is possible for an option to sell for more than 50% of the stock cost. Thus in a margin account, a covered write could be established for "free." Let's discuss this in terms of two types of calls: the in-the-money call write and the out-of-the-money call write.

Out-of-the-Money Covered Call Write. This is the simplest way to approach the strategy. One may be able to find LEAPS options that are just slightly out-of-the-money, which sell for 50% of the stock price. Understandably, such a stock would be quite volatile.

Example: GOGO stock is selling for $38 per share. GOGO has listed options, and a 2-year LEAPS call with a striking price of 40 is selling for $19. The requirement for this covered write would be zero, although some commission costs would be involved. The debit balance would be 19 points per share, the amount the broker loans you on margin.

Certain brokerage firms might require some sort of minimum margin deposit, but technically there is no further requirement for this position. Of course, the leverage is infinite. Suppose one decided to buy 10,000 shares of GOGO and sell 100 calls, covered. *His risk is $190,000 if the stock falls to zero!* That also happens to be the debit balance in his account. Thus, for a minimal investment, one could lose a fortune. In addition, if the stock begins to fall, one's broker is going to want maintenance margin. He probably wouldn't let the stock slip more than a couple of points before asking for margin. If one owns 10,000 shares and the broker wants two points maintenance margin, that means the margin call would be $20,000.

The profits wouldn't be as big as they might at first seem. The maximum gross profit potential is $210,000 if the 10,000 shares are called away at 40. The covered write makes 21 points on each share—the $40 sale price less the original cost of $19. However, one will have had to pay interest on the debit balance of $190,000 for two years. At 10%, say, that's a total of $38,000. There would also be commissions on the purchase and the sale.

In summary, this is a position with *tremendous*, even dangerous, leverage.

In-the-Money Covered Call Write. The situation is slightly different if the option is in-the-money to begin with. The above margin requirements actually don't quite accurately state the case for a margined covered call write. When a covered call is written against the stock, there is a catch: *Only 50% of the stock price or the strike price, whichever is less, is available for "release."* Thus, one will actually be required to put up more than 50% of the stock price to begin with.

Example: XYZ is trading at 50, and there is a 2-year LEAPS call with a strike price of 30, selling for 25 points. One might think that the requirement for a covered call write would be zero, since the call sells for 50% of the stock price. But that's *not* the case with in-the-money covered calls.

Margin requirement:	
Buy stock: 50 points	
Less option proceeds	–25
Less margin release*	–15*
Net requirement:	10 points

*50% of the strike price or 50% of stock price, whichever is *less*.

This position still has a lot of leverage: One invests 10 points in hopes of making 5, if the stock is called away at 30. One also would have to pay interest on the 15-point debit balance, of course, for the two-year duration of the position. Furthermore, should the stock fall below the strike price, the broker would begin to require maintenance margin.

Note that the above "formula" for the net requirement works equally well for the out-of-the-money covered call write, since 50% of the stock price is always less than 50% of the strike price in that case.

To summarize this "free ride" strategy: If one should decide to use this strategy, he must be extremely aware of the dangers of high leverage. One must not risk more money than he can afford to lose, regardless of how small the initial investment might be. Also, he must plan for some method of being able to make the margin payments along the way. Finally, the in-the-money alternative is probably better, because there is less probability that maintenance margin will be asked for.

SELLING UNCOVERED LEAPS

Uncovered option selling can be a viable strategy, especially if premiums are overpriced. LEAPS options may be sold uncovered with the same margin requirements as short-term options. Of course, the particular characteristics of the long-term option may either help or hinder the uncovered writer, depending on his objective.

Uncovered Put Selling. Naked put selling is addressed first because, as a strategy, it is equivalent to covered writing, and covered writing was just discussed. Two strategies are equivalent if they have the same profit picture at expiration. Naked put selling and covered call writing are equivalent because they have the profit picture depicted in Graph I, Appendix D. Both have limited upside profit potential and large loss exposure to the downside. In general, when two strategies are equivalent, one of the two has certain advantages over the other.

In this case, naked put selling is normally the more advantageous of the two because of the way margin requirement are set. One need not actually invest cash in the sale of a naked put; the margin requirement that is asked for may be satisfied with collateral. This means the naked put writer may use stocks, bonds, T-bills, or money market funds as collateral. Moreover, the actual amount of collateral that is required is less than the cash or margin investment required to buy stock and sell a call. This means that one could operate his portfolio normally—buying stock, then selling it and putting the proceeds in a Treasury bill or perhaps buying another stock—without disturbing his naked put position, as long as he maintained the collateral requirement.

Consequently, the *strategist* who is buying stock and selling calls should probably be selling naked puts instead. This does not apply to covered writers who are writing against existing stock or who are using the incremental return concept of covered writing, because stock ownership is part of their strategy. However, the strategist who is looking to take in premium to profit if the underlying stock remains relatively unchanged or rises, while having a modicum of downside protection (which is the definition of both naked put writing and covered writing), should be selling naked puts. As an example of this, consider the LEAPS covered write discussed previously.

Example: XYZ is selling at 50. The investor is debating between a 500-share covered write using 2-year LEAPS calls or selling five 2-year LEAPS puts. The January 50 LEAPS call sells for 8.50 and has two years of life, while the January 50 LEAPS put sells for 3.50. Further assume that XYZ pays a dividend of $0.25 per quarter.

The net investment required for the covered write is calculated as it was before; assume that commissions are 3 cents per share for stock and $5 for an option contract.

Net Investment Required—Covered Write		
Stock cost (500 shares @ 50)		$25,000
Plus stock commission	+	15
Less option premiums received	–	4,250
Plus option commissions	+	25
Net cash investment		$20,790

The collateral requirement for the naked put write is the same as that for any naked equity option: 20% of the stock price, plus the option price, less any out-of-the-money amount, with an absolute minimum requirement of 15% of the stock price.

Collateral Requirement—Naked Put		
20% of stock price (.20 × 500 ×$50)		$5,000
Plus option premium		1,750
Less out-of-the-money amount	–	0
Total collateral requirement		$6,750

Note that the actual premium received by the naked put seller is $1,750 less commissions of $25, or $1,725. This net premium could be used to reduce the total collateral requirement.

Now one can compare the profitability of the two investments:

Return If Stock Over 50 at Expiration	
	Covered Write
Stock sale (500 @ 50)	$25,000
Less stock commission	– 15
Plus dividends earned until expiration	+ 1,000
Less net investment	– 20,790
Net profit if exercised	$ 5,195
	Naked Put Sale
Net put premium received	$1,725
Dividends received	0
Net profit	$1,725

Now the returns can be compared, if XYZ is over 50 at expiration of the LEAPS:

Return if XYZ over 50
(net profit/net investment)
Naked put sale: 25.6%
Covered write: 25.0%

The naked put write has a better rate of return, even before the following fact is considered. The strategist who is using the naked put write does not have to spend the $6,750 collateral requirement in the form of cash. That money can be kept in a Treasury bill and earn interest over the two years that the put write is in place. Even if the T-bill were earning only 4% per year, that would increase the overall two-year return for the naked put sale by 8%, to 33.6%. This should make it obvious that *naked put selling is more strategically advantageous than covered call writing.*

Even so, one might rightfully wonder if LEAPS put selling is better than selling shorter-term equity puts. As was the case with covered call writing, the answer depends on what the investor is trying to accomplish. Short-term puts will not bring as much premium into the account, so when they expire, one will be forced to find another suitable put sale to replace it. On the other hand, the LEAPS put sale brings in a larger premium and one does not have to find a replacement until the longer-term LEAPS put expires. The negative aspect to selling the LEAPS puts is that time decay won't help much right away and, even if the stock moves higher (which is ostensibly good for the position), the put won't decline in price by a large amount, since the delta of the put is relatively small.

One other factor might enter in the decision regarding whether to use short-term puts or LEAPS puts. Some put writers are actually attempting to buy stock below the market price. That is, they would not mind being assigned on the put they sell, meaning that they would buy stock at a net cost of the striking price less the premium they received from the sale of the put. If they don't get assigned, they get to keep a profit equal to the premium they received when they first sold the put. Generally, a person would only sell puts in this manner on a stock that he had faith in, so that if he was assigned on the put, he would view that as a buying opportunity in the underlying stock. This strategy does not lend itself well to LEAPS. Since the LEAPS puts will carry a significant amount of time premium, there is little (if any) chance that the put writer will actually be assigned until the life of the put shortens substantially. This means that it is unlikely that the put writer will become a stock owner via assignment at any time in the near future. Consequently, if one is attempting to write puts in order to eventually buy the common stock when he is assigned, he would be better served to write shorter-term puts.

UNCOVERED CALL SELLING

There are very few differences between using LEAPS for naked call selling and using shorter-term calls, except for the ones that have been discussed already with regard to selling uncovered LEAPS: Time value decay occurs more slowly and, if the stock rallies and the naked calls have to be covered, the call writer will normally be paying more time premium than he is used to when he covers the call. Of course, the reason that one is engaged in naked call writing might shed some more light on the use of LEAPS for that purpose.

The overriding reason that most strategists sell naked calls is to collect the time premium before the stock can rise above the striking price. These strategists generally have an opinion about the stock's direction, believing that it is perhaps trapped in a trading range or even headed lower over the short term. This strategy does not lend itself well to using LEAPS, since it would be difficult to project that the stock would remain below the strike for so long a period of time.

Short LEAPS Instead of Short Stock. Another reason that naked calls are sold is as a strategy akin to shorting the common stock. In this case, in-the-money calls are sold. The advantages are threefold:

1. The amount of collateral required to sell the call is less than that required to sell stock short.
2. One does not have to borrow an option in order to sell it short, although one must borrow common stock in order to sell it short.
3. An uptick is not required to sell the option, but one is required in order to sell stock short.

For these reasons, one might opt to sell an in-the-money call instead of shorting stock.

The profit potentials of the two strategies are different. The short seller of stock has a very large profit potential if the stock declines substantially, while the seller of an in-the-money call can collect only the call premium no matter how far the stock drops. Moreover, the call's price decline will slow as the stock nears the strike. Another way to express this is to say that the delta of the call shrinks from a number close to 1 (which means the call mirrors stock movements closely) to something more like 0.50 at the strike (which means that the call is only declining half as quickly as the stock).

Another problem that may occur for the call seller is early assignment, a topic that is addressed shortly. *One should not attempt this strategy if the underlying stock is not borrowable for ordinary short sales.* If the underlying stock is not available for borrowing, it generally means that extraneous forces are at work; perhaps there is a tender offer or exchange offer going on, or some form of convertible arbitrage is taking place. In any case, if the underlying stock is not borrowable, one should not be deluded into thinking that he can sell an in-the-money call instead and have a worry-free position. In these cases, the call will normally have little or no time premium and may be subject to early assignment. If such assignment does occur, the strategist will become short the stock and, since it is not borrowable, will have to cover the stock. At the least, he will cost himself some commissions by this unprofitable strategy; and at worst, he will have to pay a higher price to buy back the stock as well.

LEAPS calls may help to alleviate this problem. Since they are such long-term calls, they are likely to have some time value premium in them. In-the-money calls that have time value premium are not normally assigned. As an alternative to shorting a stock that is not borrowable, one might try to sell an in-the-money LEAPS call, but *only if it has time value premium remaining.* Just because the call has a long time remaining until expiration does not mean that it must have time value premium, as will be seen in the following discussion. Finally, if one does sell the LEAPS call, he must realize that if the stock drops, the LEAPS call will not follow it completely. As the stock nears the strike, the amount of time value premium will build up to an even greater level in the LEAPS. Still, the naked call seller would make some profit in that case, and it presents a better alternative than not being able to sell the stock short at all.

Early Assignment. An American-style option is one that can be exercised at any time during its life. All listed equity options, LEAPS included, are of this variety. Thus, any in-the-money option that has been sold may become subject to early assignment. The clue to whether early assignment is imminent is whether there is time value premium in the option. If the option has no time value premium—in other words, it is trading at parity or at a discount—then assignment may be close at hand. The option writer who does not want to be assigned would want to cover the option when it no longer carries time premium.

LEAPS may be subject to early assignment as well. It is possible, albeit far less likely, that a long-term option would lose all of its time value premium and therefore be subject to early assignment. This would certainly happen if the underlying stock were being taken over and a tender offer were coming to fruition. However, it may also occur because of an impending dividend payment, or more specifically, because the stock is about to go ex-dividend. Recall that the call owner, LEAPS calls included, is not entitled to any dividends paid by the underlying stock. So if the call owner wants the dividend, he exercises his call on the day before the stock goes ex-dividend. This makes him an owner of the common stock just in the nick of time to get the dividend.

What economic factors motivate him to exercise the call? If there is any time value premium at all in the call, the call holder would be better off selling the call in the open market and then purchasing the stock in the open market as well. In this manner, he would still get the dividend, but he would get a better price for his call when he sold it. If, however, there is no time value premium in the call, he does not have to bother with two transactions in the open market; he merely exercises his call in order to buy stock.

All well and good, but what makes the call sell at parity before expiration? It has to do with the arbitrage that is available for any call option. In this case, the arbitrage is not the simple discount arbitrage that was discussed in Chapter 1 when this topic was covered. Rather, it is a more complicated form that is discussed in greater detail in Chapter 28. Suffice it to say that if the dividend is larger than the interest that can be earned from a credit balance equal to the striking price, then the time value premium will disappear from the call.

Example: XYZ is a $30 stock and about to go ex-dividend 50 cents. The prevailing short-term interest rate is 5% and there are LEAPS with a striking price of 20.

A 50-cent quarterly dividend on a striking price of 20 is an annual dividend rate (on the strike) of 10%. Since short-term rates are much lower than that, arbitrageurs economically cannot pay out 10% for dividends and earn 5% for their credit balances.

In this situation, the LEAPS call would lose its time value premium and would be a candidate for early exercise when the stock goes ex-dividend.

In actual practice, the situation is more complicated than this, because the price of the puts comes into play; but this example shows the general reasoning that the arbitrageur must go through.

Certain arbitrageurs construct positions that allow them to earn interest on a credit balance equal to the striking price of the call. This position involves being short the underlying stock and being long the call. Thus, when the stock goes ex-dividend, the arbitrageur will owe the dividend. If, however, the amount of the dividend is more than he

will earn in interest from his credit balance, he will merely exercise his call to cover his short stock. This action will prevent him from having to pay out the dividend.

The arbitrageur's exercise of the call means that someone is going to be assigned. If you are a writer of the call, it could be you. It is not important to understand the arbitrage completely; its effect will be reflected in the marketplace in the form of a call trading at parity or a discount. *Thus, even a LEAPS call with a substantial amount of time remaining may be assigned if it is trading at parity.*

STRADDLE SELLING

Straddle selling is equivalent to ratio writing and is a strategy whereby one attempts to sell (overpriced) options in order to produce a range of stock prices within which the option seller can profit. The strategy often involves follow-up action as the stock moves around, and the strategist feels that he must adjust his position in order to prevent large losses. LEAPS puts and calls might be used for this strategy. However, their long-term nature is often not conducive to the aims of straddle selling.

First, consider the effect of time decay. One might normally sell a three-month straddle. If the stock "behaves" and is relatively unchanged after two months have passed, the straddle seller could reasonably expect to have a profit of about 40% of the original straddle price. However, if one had sold a 2-year LEAPS straddle, and the stock were relatively unchanged after two months, he would only have a profit of about 7% of the original sale price. This should not be surprising in light of what has been demonstrated about the decaying of long-term options. It should make the straddle seller somewhat leery of using LEAPS, however, unless he truly thinks the options are overpriced.

Second, consider follow-up action. Recall that in Chapter 20, it was shown that the bane of the straddle seller was the whipsaw. A whipsaw occurs when one makes a follow-up protective action on one side (for instance, he does something bullish because the underlying stock is rising and the short calls are losing money), only to have the stock reverse and come crashing back down. Obviously, the more time left until expiration, the more likely it is that a whipsaw will occur after any follow-up action, and the more expensive it will be, since there will be a lot of time value premium left in the options that are being repurchased. This makes LEAPS straddle selling less than attractive.

LEAPS straddles may look expensive because of their large absolute price, and therefore may appear to be attractive straddle sale candidates. However, the price is often justified, and the seller of LEAPS straddles will be fighting sudden stock movements without getting much benefit from the passage of time. The best time to sell LEAPS straddles is when short-term rates are high and volatilities are high as well (i.e., the options are overpriced). At least, in those cases, the seller will derive some real benefit if rates or volatilities should drop.

SPREADS USING LEAPS

Any of the spread strategies previously discussed can be implemented with LEAPS as well, if one desires. The margin requirements are the same for LEAPS spreads as they are for ordinary equity option spreads. One general category of spread lends itself well to using LEAPS: that of buying a longer-term option and selling a short-term one. Calendar spreads, as well as diagonal spreads, fall into that category.

The combinations are myriad, but the reasoning is the same. One wants to own the option that is not so subject to time decay, while simultaneously selling the option that is quite subject to time decay. Of course, since LEAPS are long-term and therefore expensive, one is generally taking on a large debit in such a spread and may have substantial risk if the stock performs adversely. Other risks may be present as well. As a means of demonstrating these facts, let us consider a simple bull spread using calls.

Example: The following prices exist in the month of January:

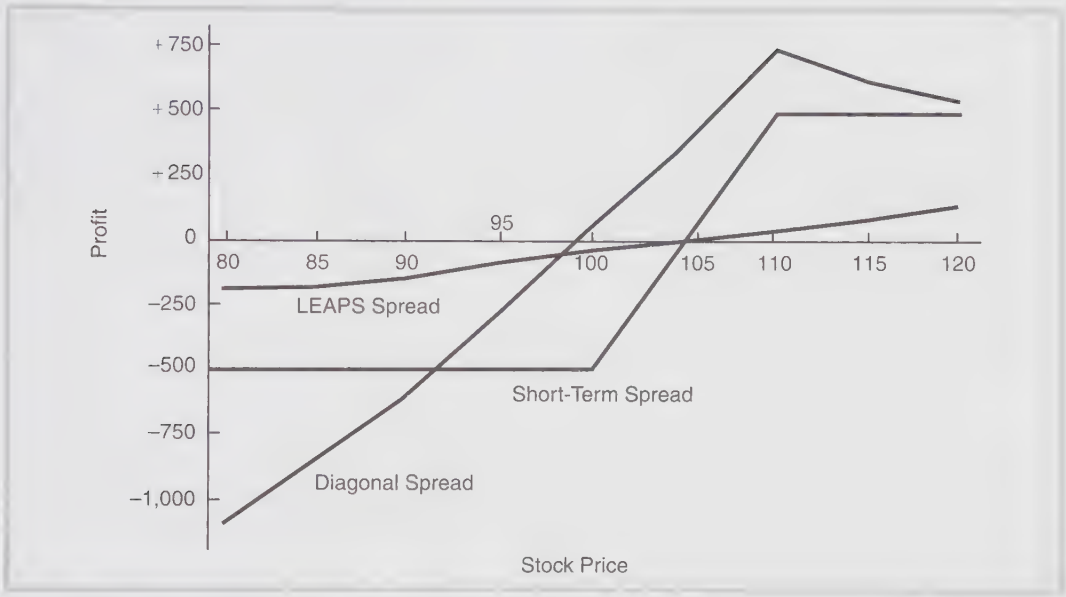
XYZ: 105
April 100 call: 10.50
April 110 call: 5.50
January (2-year) 100 call: 26
January (2-year) 110 call: 21.50

An investor is considering a bull spread in XYZ and is unsure about whether to use the short-term calls, the LEAPS calls, or a mixture. These are his choices:

Short-term bull spread:	Buy April 100 @ 10.50
	Sell April 110 @ 5.50
	Net Debit: $500
Diagonal bull spread:	Buy January LEAPS 100 @ 26
	Sell April 110 @ 5.50
	Net Debit: $2,050
LEAPS bull spread:	Buy January LEAPS 100 @ 26
	Sell January LEAPS 110 @ 21.50
	Net Debit: $450

Notice that the debit paid for the LEAPS spread is slightly less than that of the short-term bull spread. This means that they have approximately the same profit potential at

FIGURE 25-7.
Bull spread comparison at April expiration.



their respective expiration dates. However, the strategist is more concerned with how these compare directly with each other. The obvious point in time to make this comparison is when the short-term options expire.

Figure 25-7 shows the profitability of these three positions at April expiration. It was assumed that all of the following were the same in April as they had been in January: volatility, short-term rates, and dividend payout.

Note that the short-term bull spread has the familiar profit graph from Chapter 7, making its maximum profit over 110 and taking its maximum loss below 100. (See Table 25-4.)

The LEAPS spread doesn't generate much of either a profit or a loss in only three months' time. Even if XYZ rises to 120, the LEAPS bull spread will have only a $150 profit. Conversely, if XYZ falls to 80, the spread loses only about $200. This price action is very typical for long-term bull spreads when both options have a significant amount of time premium remaining in them.

The diagonal spread is different, however. Typically, the maximum profit potential of a bull spread is the difference in the strikes less the initial debit paid. For this diagonal spread, that would be $1,000 minus $2,050, a loss! Obviously, this simple formula is not applicable to diagonal spreads, because the purchased option still has time value premium when the written option expires. The profit graph shows that indeed the diagonal spread is the most bullish of the three. It makes its best profit at the strike of the written option—a

TABLE 25-4.
Bull spread comparison at April expiration.

Stock Price	Short-Term	Diagonal	LEAPS
80	–500	–1,100	–200
90	–500	– 600	–150
100	–500	50	– 25
110	500	750	50
120	500	550	150
140	500	150	250
160	500	– 50	350
180	500	– 350	450

standard procedure for any spread—and that profit it is greater than either of the other two spreads *at April expiration* (under the significant assumption that volatility and interest rates are unchanged). If XYZ trades higher than 110, the diagonal spread will lose some of its profit; in fact, if XYZ were to trade at a very high price, the diagonal spread would actually have a loss (see Table 25-4). Whenever the purchased LEAPS call loses its time value premium, the diagonal spread will not perform as well.

If the common stock drops in price, the diagonal spread has the greatest risk in dollar terms but not in percentage terms, because it has the largest initial debit. If XYZ falls to 80 in three months, the spread will lose about $1,100, just over half the initial $2,050 debit. Obviously, the short-term spread would have lost 100% of its initial debit, which is only $500, at that same point in time.

The diagonal spread presents an opportunity to earn more money if the underlying common is near the strike of the written option when the written option expires. However, if the common moves a great deal in either direction, the diagonal spread is the worst of the three. This means that the diagonal spread strategy is a neutral strategy: One wants the underlying common to remain near the written strike until the near-term option expires. This is a true statement even if the diagonal spread is under the guise of a bullish spread, as in the previous example.

Many traders are fond of buying LEAPS and selling an out-of-the-money near-term call as a hedge. Be careful about doing this. If the underlying common rises too fast and/or interest rates fall and/or volatility decreases, this could be a poor strategy. There is really nothing quite as psychologically damaging as being right about the stock, but being in the wrong option strategy and therefore losing money. Consider the above examples. Ostensibly, the spreader was bullish on XYZ; that's why he chose bull spreads. If XYZ

became a wildly bullish stock and rose from 100 to 180 in three months, the diagonal spreader would have lost money. He couldn't have been happy—no one would be. This is something to keep in mind when diagonalizing a LEAPS spread.

The deltas of the options involved in the spread will give one a good clue as to how it going to perform. Recall that a short-term, in-the-money option acquires a rather high delta, especially as expiration draws nigh. However, an in-the-money LEAPS call will *not* have an extremely high delta, because of the vast amount of time remaining. Thus, one is short an option with a high delta and long an option with a smaller delta. These deltas indicate that one is going to lose money if the underlying stock rises in price. Consider the following situation:

XYZ Stock, 120:	
Call	**Position Delta**
Long 1 January LEAPS 100 call:	0.70
Short 1 April 110 call:	–0.90

At this point, if XYZ rises in price by 1 point, the spread can be expected to lose 20 cents, since the delta of the short option is 0.20 greater than the delta of the long option.

This phenomenon has ramifications for the diagonal spreader of LEAPS. If the two strike prices of the spread are too close together, it may actually be possible to construct a bull spread that *loses* money on the upside. That would be very difficult for most traders to accept. In the above example, as depicted in Table 25-4, that's what happens. One way around this is to widen the strike prices out so that there is at least *some* profit potential, even if the stock rises dramatically. That may be difficult to do and still be able to sell the short-term option for any meaningful amount of premium.

Note that a diagonal spread could even be considered as a substitute for a covered write in some special cases. It was shown that a LEAPS call can sometimes be used as a substitute for the common stock, with the investor placing the difference between the cost of the LEAPS call and the cost of the stock in the bank (or in T-bills). Suppose that an investor is a covered writer, buying stock and selling relatively short-term calls against it. If that investor were to make a LEAPS call substitution for his stock, he would then have a diagonal bull spread. Such a diagonal spread would probably have less risk than the one described above, since the investor presumably chose the LEAPS substitution because it was "cheap." Still, the potential pitfalls of the diagonal bull spread would apply to this situation as well. Thus, if one is a covered writer, this does not necessarily mean that he can substitute LEAPS calls for the long stock without taking care. The resulting position may not resemble a covered write as much as he thought it would.

The "bottom line" is that if one pays a debit greater than the difference in the strike prices, he may eventually lose money if the stock rises far enough to virtually eliminate the time value premium of both options. This comes into play also if one rolls his options *down* if the underlying stock declines. Eventually, by doing so, he may *invert* the strikes—i.e., the striking price of the written option is lower than the striking price of the option that is owned. In *that* case, he will have locked in a loss if the overall *credit* he has received is less than the difference in the strikes—a quite likely event. So, for those who think this strategy is akin to a guaranteed profit, think again. It most certainly is not.

Backspreads. LEAPS may be applied to other popular forms of diagonal spreads, such as the one in which in-the-money, near-term options are sold, and a greater quantity of longer-term (LEAPS) at- or out-of-the money calls are bought. (This was referred to as a diagonal backspread in Chapter 14.) This is an excellent strategy, and a LEAPS may be used as the long option in the spread. Recall that the object of the spread is for the stock to be volatile, particularly to the upside if calls are used. If that doesn't happen, and the stock declines instead, at least the premium captured from the in-the-money sale will be a gain to offset against the loss suffered on the longer-term calls that were purchased. The strategy can be established with puts as well, in which case the spreader would want the underlying stock to fall dramatically while the spread was in place.

Without going into as much detail as in the examples above, the diagonal backspreader should realize that he is going to have a significant debit in the spread and could lose a significant portion of it should the underlying stock fall a great deal in price. To the upside, his LEAPS calls will retain some time value premium and will move quite closely with the underlying common stock. Thus, he does not have to buy as many LEAPS as he might think in order to have a neutral spread.

Example: XYZ is at 105 and a spreader wants to establish a backspread. Recall that the quantity of options to use in a neutral strategy is determined by dividing the deltas of the two options. Assume the following prices and deltas exist:

XYZ: 105 in January		
Option	Price	Delta
April 100 call	8	0.75
July 110 call	5	0.50
January (2-year) LEAPS 100 call	15	0.60

Two backspreads are available with these options. In the first, one would sell the April 100 calls and buy the July 110 calls. He would be selling 3-month calls and buying

6-month calls. The neutral ratio is 0.75/0.50 or 3 to 2; that is, 3 calls are to be bought for every 2 sold. Thus, a neutral spread would be:

Buy 6 July 110 calls
Sell 4 April 100 calls

As a second alternative, he might use the LEAPS as the long side of the spread; he would still sell the April 100 calls as the short side of the spread. In this case, his neutral ratio would be 0.75/0.60, or 5 to 4. The resulting neutral spread would be:

Buy 5 January LEAPS 110 calls
Sell 4 Apr l 100 calls

Thus, a neutral backspread involving LEAPS requires buying fewer calls than a neutral backspread involving a 6-month option on the long side. This is because the delta of the LEAPS call is larger. The significant point here is that, because of the time value retention of the LEAPS call, even when the stock moves higher, it is not necessary to buy as many. If one does not use the deltas, but merely figures that 3 to 2 is a good ratio for any diagonal backspread, then he will be overly bullish if he uses LEAPS. That could cost him if the underlying stock declines.

Calendar Spreads. LEAPS may also be used in calendar spreads—spreads in which the striking price of the longer-term option purchased and the shorter-term option sold are the same. The calendar spread is a neutral strategy, wherein the spreader wants the underlying stock to be as close as possible to the striking price when the near-term option expires. A calendar spread has risk if the stock moves too far away from the striking price (see Chapter 9 and 22). Purchasing a LEAPS call increases that risk in terms of dollars, not percentage, because of the larger debit that one must spend for the spread.

Simplistically, calendar spreads are established with equal quantities of options bought and sold. This is often not a neutral strategy in the true sense. As was shown in Chapter 9 on call calendar spreads, one may want to use the deltas of the two options to establish a truly neutral calendar spread, particularly if the stock is not initially right at the striking price. Out-of-the-money, one would sell more calls than he is buying. Conversely, in-the-money, one would buy more calls than he is selling. Both strategies statistically have merit and are attractive. When using LEAPS deltas to construct the neutral spread, one need generally buy fewer calls than he might think, because of the higher delta of a LEAPS call. This is the same phenomenon described in the previous example of a diagonal backspread.

SUMMARY

LEAPS are nothing more than long-term options. They are usable in a wide variety of strategies in the same way that any option would be. Their margin and investment requirements are similar to those of the more familiar equity options. Both LEAPS puts and calls are traded, and there is a secondary market for them as well.

There are certain differences between the prices of long-term options and those of shorter-term options, but the greatest is the relatively large effect that interest rates and dividends have on the price of long-term options. Increases in interest rates will cause LEAPS to increase in price, while increases in dividend payout will cause LEAPS calls to decrease in price and LEAPS puts to increase in price. As usual, volatility has a major effect on the price of an option, and long-term options are no exception. Even small changes in the volatility of the underlying common stock can cause large price differences in a two-year option. The rate of decay due to time is much smaller for long-term options. Finally, the deltas of LEAPS calls are larger than those of short-term calls; conversely, the deltas of LEAPS puts are smaller.

Several common strategies lend themselves well to the usage of LEAPS. A LEAPS may be used as a stock substitute if the cash not invested in the stock is instead deposited in a CD or T-bill. LEAPS puts can be bought as protection for common stock. Speculative option buyers will appreciate the low rate of time decay of LEAPS. LEAPS calls can be written against common stock, thereby creating a covered write, although the sale of naked LEAPS puts is probably a better strategy in most cases. Spread strategies with LEAPS may be viable as well, but the spreader should carefully consider the ramifications of buying a long-term option and selling a shorter-term one against it. If the underlying stock moves a great distance quickly, the spread strategy may not perform as expected.

Overall, long-term options are not very different from the shorter-term options to which traders and investors have become accustomed. Once these investors become familiar with the way these long-term options are affected by the various factors that determine the price of an option, they will consider the use of long-term options as an integral part of a strategic arsenal.

PART IV

Additional Considerations

CHAPTER 26

Buying Options and Treasury Bills

Numerous strategies have been described, ranging from the simple to the complex. Each one has advantages, but there are disadvantages as well. In fact, some of them may be too complex for the average investor to seriously consider implementing. The reader may feel that there should be an easier answer. Isn't there a strategy that might not require such a large investment or so much time spent in monitoring the position, but would still have a chance of returning a reasonable profit? In fact, there is a strategy that has not yet been described, a strategy considered by some experts in the field of mathematical analysis to be the best of them all. Simply stated, *the strategy consists of putting 90% of one's money in risk-free investments (such as short-term Treasury bills) and buying options with the remaining 10% of one's funds.*

It has previously been pointed out that some of the more attractive strategies are those that involve small levels of risk with the potential for large profits. Usually, these types of strategies inherently have a rather large frequency of small losses, and a small probability of realizing large gains. Their advantage lies in the fact that one or two large profits can conceivably more than make up for numerous small losses. This Treasury bill/option strategy is another strategy of this type.

HOW THE TREASURY BILL/OPTION STRATEGY OPERATES

Although there are certain details involved in operating this strategy, it is basically a simple one to approach. First, the most that one can lose is 10%, less the interest earned on the fixed-income portion of his portfolio (the remaining 90% of his assets), during

the life of the purchased options. It is a simple matter to space out one's commitments to option purchases so that his overall risk in a one-year period can be kept down to nearly 10%.

Example: An investor might decide to put 2½% of his money into three-month option purchases. Thus, in any one year, he would be risking 10%. At the same time he would be earning perhaps 6% from the overall interest generated on the fixed-income securities that make up the remaining 90% of his assets. This would keep his overall risk down to approximately 4.6% per year.

There are better ways to monitor this risk, and they are described shortly. The potential profits from this strategy are limited only by time. Since one is owning options—say call options—he could profit handsomely from a large upward move in the stock market. As with any strategy in which one has limited risk and the potential of large profits, a small number of large profits could offset a large number of small losses. In actual practice, of course, his profits will never be overwhelming, since only approximately 10% of the money is committed to option purchases.

It should be noted that when interest rates are extremely low, there is no "interest earned" component from the T-bills—or very little, at best. In that case, one might want to consider investments with slightly more risk than T-bills for the 90% of the assets that are *not* invested in long options. These might be AAA corporate bonds, or something similar. However, one should not take any untoward risk with the interest-earning portion of this strategy—such as junk bonds, for example. The idea is that the interest-earning portion is safe, and the option-buying portion is risky. To introduce much risk into the interest-earning portion would be to change the strategy's objectives too radically.

In total, *this strategy has greatly reduced risk with the potential of making above-average profits.* Since the 10% of the money that is invested in options gives great leverage, it might be possible for that portion to double or triple in a short time under favorable market conditions. This strategy is something like owning a convertible bond. A convertible bond, since it is convertible into the common stock, moves up and down in price with the price of the underlying stock. However, if the stock should fall a great deal, the bond will not follow it all the way down, because eventually its yield will provide a "floor" for the price.

A strategy that is not used very often is called the "synthetic convertible bond." One buys a debenture and a call option on the same stock. If the stock rises in price, the call does, too, and so the combination of the debenture and the call acts much like a convertible bond would to the upside. If, on the other hand, the stock falls, the call will expire

worthless; but the investor will retain most of his investment, because he will still have the debenture plus any interest that the bond has paid.

The strategy of placing 90% of one's money into risk-free, interest-bearing certificates and buying options with the remainder is superior to the convertible bond or the "synthetic convertible bond," since there is no risk of price fluctuation in the largest portion of the investment.

The Treasury bill/option strategy is fairly easy to operate, although one does have to do some work every time new options are purchased. Also, periodic adjustments need to be made to keep the level of risk approximately the same at all times. As for which options to buy, the reader may recall that specifications were outlined in Chapters 3 and 16 on how to select the best option purchases. These criteria can be summarized briefly as follows:

1. Assume that each underlying stock can advance or decline in accordance with its volatility over a fixed time period (30, 60, or 90 days).
2. Estimate the call prices after the advance, or put prices after the decline.
3. Rank all potential purchases by the highest reward opportunity.

The user of this strategy need only be interested in those option purchases that provide the highest reward opportunity under this ranking method. In the previous chapters on option buying, it was mentioned that one might want to look at the risk/reward ratios of his potential option purchases in order to have a more conservative list. However, that is not necessary in the Treasury bill/option strategy, since the overall risk has already been limited. A ranking of option purchases via the foregoing criteria will generally give a list of at- or slightly out-of-the-money options. These are not necessarily "underpriced" options; although if an option is truly underpriced, it will have a better chance of ranking higher on the selection list than one that is "overpriced."

A list of potential option purchases that is constructed with criteria similar to those outlined above is available from many data services and brokerage firms. The strategist who is willing to select his option purchases in this manner will find that he does not have to spend a great deal of time on the selection process. The reader should note that *this type of option purchase ranking completely ignores the outlook for the underlying stock.* If one would rather make his purchases based on an outlook for the underlying stock—preferably a technical outlook—he will be forced to spend more time on his selection process. Although this may be appealing to some investors, it will probably yield worse results in the long run than the previously described unbiased approach to option purchases, unless the strategist is extremely adept at stock selection.

KEEPING THE RISK LEVEL EQUAL

The second function that the strategist has to perform in this Treasury bill/option strategy is to keep his risk level approximately equal at all times.

Example: An investor starts the strategy with $90,000 in Treasury bills (T-bills) and $10,000 in option purchases. After some time has passed, the option purchases may have worked out well and perhaps he now has $90,000 in T-bills plus $30,000 worth of options, plus interest from the T-bills. Obviously, he no longer has 90% of his money in fixed-income securities and 10% in option purchases. The ratio is now 75% in T-bills and 25% in option purchases. This is too risky a ratio, and the strategist must consequently sell some of his options and buy T-bills with the proceeds. Since his total assets are $120,000 currently, he must sell out $18,000 of options to bring his option investment down from the current $30,000 figure to $12,000, or 10% of his total assets. If one fails to adhere to this readjustment of his funds after profits are made, he may eventually lose those profits. Since options can lose a great percentage of their worth in a short time period, the investor is always running the risk that the option portion of his investment may be nearly wiped out. If he has kept all his profits in the option portion of his strategy, he is constantly risking nearly all of his accumulated profits, and that is not wise.

One must also adjust his ratio of T-bills to options after losses occur.

Example: In the first year, the strategist loses all of the $10,000 he originally placed in options. This would leave him with total assets of $90,000 plus interest (possibly $6,000 of interest might be earned). He could readjust to a 90:10 ratio by selling out some of the T-bills and using the proceeds to buy options. If one follows this strategy, he will be risking 10% of his funds each year. Thus, a series of loss years could depreciate the initial assets, although the net losses in one year would be smaller than 10% because of the interest earned on the T-bills. It is recommended that the strategist pursue this method of readjusting his ratios in both up and down markets in order to constantly provide himself with essentially similar risk/reward opportunities at all times.

The individual can blend the option selection process and the adjustment of the T-bill/option ratio to fit his individual portfolio. The larger portfolio can be diversified into options with differing holding periods, and the ratio adjustments can be made quite frequently, perhaps once a month. The smaller investor should concentrate on somewhat longer holding periods for his options, and would adjust the ratio less often. Some examples might help to illustrate the way in which both the large and small strategist might operate. It should be noted that this T-bill/option strategy is quite adaptable to fairly small sums of money, as long

as the 10% that is going to be put into option purchases allows one to be able to participate in a reasonable manner. A tactic for the extremely small investor is also described below.

ANNUALIZED RISK

Before getting into portfolio size, let us describe the concept of annualized risk. One might want to purchase options with the intent of holding some of them for 30 days, some for 90 days, and some for 180 days. Recall that he does not want his option purchases to represent more than 10% annual risk at any time. In actual practice, if one purchases an option that has 90 days of life, but he is planning to hold the option only 30 days, he will most likely not lose 100% of his investment in the 30-day period. However, for purposes of computing annualized risk easily, the assumption that will be made is that the risk during any *holding period* is 100%, regardless of the length of time remaining in the life of the option. Thus, a 30-day option purchase represents an annualized risk of 1,200% (100% risk every 30 days times twelve 30-day periods in one year). Ninety-day purchases have 400% annualized risk, and 180-day purchases have 200% annualized risk. There is a multitude of way to combine purchases in these three holding periods so that the overall risk is 10% annualized.

Example: An investor could put 2½% of his total money into 90-day purchases four times a year. That is, 2½% of his total assets are being subjected to a 400% annualized risk; 400% times 2½% equals 10% annualized risk on the total assets. Of course, the remainder of the assets would be placed in risk-free, income-bearing securities. Another of the many combinations might be to place 1% of the total assets in 90-day purchases and also place 3% of the total assets in 180-day purchases. Thus, 1% of one's total money would be subjected to a 400% annual risk and 3% would be subjected to a 200% annual risk (.01 times 400 plus .03 times 200 equals 10% annualized risk on the entire assets). If one prefers a formula, annualized risk can be computed as:

$$\text{Annualized risk on entire portfolio} = \frac{\text{Percent of total}}{\text{assets invested}} \times \frac{360}{\text{Holding period}}$$

If one is able to diversify into several holding periods, the annualized risk is merely the sum of the risks for each holding period.

With this information in mind, the strategist can utilize option purchases of 1 month, 3 months, and 6 months, preferably each generated by a separate computer analysis similar to the one described earlier. He will know how much of his total assets he can place into purchases of each holding period, because he will know his annualized risk.

Example: Suppose that a very large investor, or pool of investors, has $1 million committed to this T-bill/option strategy. Further, suppose ½ of 1% of the money is to be committed to 30-day option purchases with the idea of reinvesting every 30 days. Similarly, ½ of 1% is to be placed in 90-day purchases and 1% in 180-day purchases. The annualized risk is 10%:

$$\text{Total annualized risk} = \tfrac{1}{2}\% \times \frac{360}{30} + \tfrac{1}{2}\% \times \frac{360}{90} + 1\% \times \frac{360}{180}$$
$$= .06 + .02 + .02 = 10\%$$

With assets of $1 million, this means that $5,000 would be committed to 30-day purchases; $5,000 to 90-day purchases; and $10,000 to 180-day purchases. This money would be reinvested in similar quantities at the end of each holding period.

RISK ADJUSTMENT

The subject of adjusting the ratio to constantly reflect 10% risk must be addressed at the end of each holding period. Although it is correct for the investor to keep his percentage commitments constant, he must not be deluded into automatically reinvesting the same amount of dollars each time.

Example: At the end of 30 days, the value of the entire portfolio, including potential option profits and losses, and interest earned, was down to $990,000. Then only ½ of 1% of *that* amount should be invested in the next 30-day purchase ($4,950).

By operating in this manner—first computing the annualized risk and balancing it through predetermined percentage commitments to holding periods of various lengths; and second, readjusting the actual dollar commitment at the end of each holding period—the overall risk/reward ratios will be kept close to the levels described in the earlier, simple description of this strategy. This may require a relatively large amount of work on the part of the strategist, but large portfolios usually do require work.

The smaller investor does not have the luxury of such complete diversification, but he also does not have to adjust his total position as often.

Example: An investor decided to commit $50,000 to this strategy. Since there is a 1,200% annualized risk in 30-day purchases, it does not make much sense to even consider purchases that are so short-term for assets of this size. Rather, he might decide to commit 1% of his assets to a 90-day purchase and 3% to a 180-day purchase. In dollar amounts, this would be $500 in a 90-day option and $1,500 in 180-day options. Admittedly, this does not leave much room for diversification, but to risk more in the short-term purchases

would expose the investor to too much risk. In actual practice, this investor would probably just invest 5% of his assets in 180-day purchases, also a 10% annualized risk. This would mean that he could operate with only one option buyer's analysis (the 180-day one) and could place $2,500 into selections from that list.

His adjustments of the assets committed to option purchases could not be done as frequently as the large investor, because of the commissions involved. He certainly would have to adjust every 180 days, but might prefer to do so more frequently—perhaps every 90 days—to be able to space his 180-day commitments over different option expiration cycles. It should also be pointed out that T-bills can be bought and sold only in amounts of at least $10,000 and in increments of $5,000 thereafter. That is, one could buy or sell $10,000 or $15,000 or $20,000 or $25,000, and so on, but could not buy or sell $5,000 or $8,000 or $23,000 in T-bills. This is of little concern to the investor with $1 million, since it takes only a fraction of a percentage of his assets to be able to round up to the next $5,000 increment for a T-bill sale or purchase. However, the medium-sized investor with a $50,000 portfolio might run into problems. While short-term T-bills do represent the best risk-free investment, the medium-sized investor might want to utilize one of the no-load, money market funds for at least part of his income-bearing assets. Such funds have only slightly more risk than T-bills and offer the ability to deposit and withdraw in any amount.

The truly small investor might be feeling somewhat left out. Could it be possible to operate this strategy with a very small amount of money, such as $5,000? Yes it could, but there are several disadvantages.

Example: It would be extremely difficult to keep the risk level down to 10% annually with only $5,000. For example, 5% of the money invested every 180 days is only $250 in each investment period. Since the option selection process that is described will tend to select at- or slightly out-of-the-money calls, many of these will cost more than 2½ points for one option. The small investor might decide to raise his risk level slightly, although the risk level should never exceed 20% annually, no matter how small the actual dollar investment. To exceed this risk level would be to completely defeat the purpose of the fixed-income/option purchase strategy. Obviously, this small investor cannot buy T-bills, for his total investable assets are below the minimum $10,000 purchase level. He might consider utilizing one of the money market funds. Clearly, an investor of this small magnitude is operating at a double disadvantage: His small dollar commitment to option purchases may preclude him from buying some of the more attractive items; and his fixed-income portion will be earning a smaller percentage interest rate than that of the larger investor who is in T-bills or some other form of relatively risk-free, income-bearing security. Consequently, *the small investor should carefully consider his financial capability and willingness to adhere strictly to the criteria of this strategy before actually committing his dollars.*

* * *

It may appear to the reader that the actual dollars being placed at risk in each option purchase are quite small in these examples. In fact, they are rather small, but they have been shown to represent 10% annualized risk. An assumption was made in these examples that the risk in each option purchase was 100% for the holding period. This is a fairly restrictive assumption and, if it were lessened, would allow for a larger dollar commitment in each holding period. It is difficult and dangerous, however, to assume that the risk in holding a call option is less than 100% in a holding period as short as 30 days. The strategist may feel that he is disciplined enough to sell out when losses occur and thereby hold the risk to less than 100%. Alternatively, mathematical analysis will generally show that the expected loss in a fixed time period is less than 100%. One can also mitigate the probability of losing all of his money in an option purchase by buying in-the-money options. While they are more expensive, of course, they do have a larger probability of having some residual worth even if the underlying stock doesn't rise to the trader's expectations. Adhering to any of these criteria can lead one to become too aggressive and therefore be too heavily committed to option purchases. It is far safer to stick to the simpler, more restrictive assumption that one is risking all his money, even over a fairly short holding period, when he buys an option.

AVOIDING EXCESSIVE RISK

One final word of caution must be inserted. *The investor should not attempt to become "fancy" with the income-bearing portion of his assets.* T-bills may appear to be too "tame" to some investors, and they consider using GNMA's (Government National Mortgage Association certificates), corporate bonds, convertible bonds, or municipal bonds for the fixed-income portion. Although the latter securities may yield a slightly higher return than do T-bills, they may also prove to be less liquid and they quite clearly involve more risk than a short-term T-bill does. Moreover, some investors might even consider placing the balance of their funds in other places, such as high-yield stock or covered call writing. While high-yield stock purchases and covered call writing are conservative investments, as most investments go, they would have to be considered very speculative in comparison to the purchase of a 90-day T-bill. In this strategy, the profit potential is represented by the option purchases. The yield on short-term T-bills will quite adequately offset the risks. One should take great care not to attempt to generate much higher yields on the fixed-income portion of his investment, for he may find that he has assumed risk with the portion of his money that was not intended to have any risk at all.

A fair amount of rigorous mathematical work has been done on the evaluation of this strategy. *The theoretical papers are quite favorable.* Scholars have generally considered

only the purchase of call options as the risk portion of the strategy. Obviously, the strategist is quite free to purchase put options without harming the overall intent of the strategy. When only call options are purchased, both static and down markets harm the performance. If some puts are included in the option purchases, only static markets could produce the worst results.

There are trade-offs involved as well. If, after purchasing the options, the market experiences a substantial rally, that portion of the option purchase money that is devoted to put option purchases will be lost. Thus, the combination of both put and call purchases would do better in a down market than a strategy of buying only calls, but would do worse in an up market. In a broad sense, it makes sense to include some put purchases if one has the funds to diversify, since the frequency of market rallies is smaller than the combined frequency of market rallies and declines. The investor who owns both puts and calls will be able to profit from substantial moves in either direction, because the profitable options will be able to overcome the limited losses on the unprofitable ones.

SUMMARY

In summary, the T-bill/option strategy is attractive from several viewpoints. *Its true advantage lies in the fact that it has predefined risk and does not have a limit on potential profits.* Some theorists claim it is the best strategy available, if the options are "underpriced" when they are purchased. The strategy is also relatively simple to operate. It is not necessary to have a margin account or to compute collateral requirements for uncovered options; the strategy can be operated completely from a cash account. There are no spreads involved, nor is it necessary to worry about details such as early assignment (because there are no short options in this strategy).

The investor who is going to employ this strategy, however, must not be deluded into thinking that it is so simple that it does not take any work at all. The concepts and application of annualized risk management are very important to the strategy. So are the mechanics of option buying—particularly a disciplined, rational approach to the selection of which calls and/or puts to buy. In addition, if interest rates are so low that T-bills produce virtually no income, then one must manage the interest-earning portion of this portfolio as well—in higher-yielding, but still safe, bonds. Consequently, this strategy is suitable only for the investor who has both the time and the discipline to operate it correctly.

CHAPTER 27

Arbitrage

Arbitrage in the securities market often connotes that one is buying something in one marketplace and selling it in another marketplace, for a small profit with little or no risk. For example, one might buy XYZ at 55 in New York and sell it at 55¼ in Chicago. Arbitrage, especially option arbitrage, involves a far wider range of tactics than this simple example. Many of the option arbitrage tactics involve buying one side of an equivalent position and simultaneously selling the other side. Since there is a large number of equivalent strategies, many of which have been pointed out in earlier chapters, a full-time option arbitrageur is able to construct a rather large number of positions, most of which have little or no risk. The public customer cannot generally operate arbitrage-like strategies because of the commission costs involved. Arbitrageurs are firm traders or floor traders who are trading through a seat on the appropriate securities exchange, and therefore have only minimal transaction costs.

The public customer can benefit from understanding arbitrage techniques, even if he does not personally employ them. The arbitrageurs perform a useful function in the option marketplace, often making markets where a market might not otherwise exist (deeply in-the-money options, for example). This chapter is directed at the strategist who is actually going to be participating in arbitrage. This should not be confusing to the public customer, for he will better understand the arbitrage strategies if he temporarily places himself in the arbitrageur's shoes.

It is virtually impossible to perform pure arbitrage on dually listed options; that is, to buy an option on the CBOE and sell it on the American exchange in New York for a profit. Such discrepancies occur so infrequently and in such small size that an option arbitrageur could never hope to be fully employed in this type of simple arbitrage. Rather, the more complex forms of arbitrage described here are the ones on which he would normally concentrate.

BASIC PUT AND CALL ARBITRAGE ("DISCOUNTING")

The basic call and the basic put arbitrages are two of the simpler forms of option arbitrage. In these situations, *the arbitrageur attempts to buy the option at a discount while simultaneously taking an opposite position in the underlying stock.* He can then exercise his option immediately and make a profit equal to the amount of the discount.

The basic call arbitrage is described first. This was also outlined in Chapter 1, under the section on anticipating exercise.

Example: XYZ is trading at 58 and the XYZ July 50 call is trading at 7.90. The call is actually at a discount from parity of 10 cents. Discount options generally either are quite deeply in-the-money or have only a short time remaining until expiration, or both. The call arbitrage would be constructed by:

1. buying the call at 7.90;
2. selling the stock at 58;
3. exercising the call to buy the stock at 50.

The arbitrageur would make 8 points of profit from the stock, having sold it at 58 and bought it back at 50 via the option exercise. He loses the 7.90 points that he paid for the call option, but this still leaves him with an overall profit of 10 cents. Since he is a member of the exchange, or is trading the seat of an exchange member, the arbitrageur pays only a small charge to transact the trades.

In reality, the stock is not sold *short* per se, even though it is sold before it is bought. Rather, the position is designated, at the time of its inception, as an "irrevocable exercise." The arbitrageur is promising to exercise the call. As a result, no uptick is required to sell the stock.

The main goal in the call arbitrage is to be able to buy the call at a discount from the price at which the stock is sold. The differential is the profit potential of the arbitrage. *The basic put arbitrage is quite similar* to the call arbitrage. Again, the arbitrageur is looking to buy the put option at a discount from parity. The put arbitrage is completed with a stock purchase and option exercise.

Example: XYZ is at 58 and the XYZ July 70 put is at 11.90. With the put at a 10-cent discount from parity, the arbitrageur might take the following action:

1. Buy put at 11.90.
2. Buy stock at 58.
3. Exercise put to sell stock at 70.

The stock transaction is a 12-point profit, since the stock was bought at 58 and is sold at 70 via the put exercise. The cost of the put—11.90 points—is lost, but the arbitrageur still makes a 10-cent profit. Again, *this profit is equal to the amount of the discount in the option when the position was established.* Generally, the arbitrageur would exercise his put option immediately, because he would not want to tie up his capital to carry the long stock. An exception to this would be if the stock were about to go ex-dividend. Dividend arbitrage is discussed in the next section.

The basic call and put arbitrages may exist at any time, although they will be more frequent when there is an abundance of deeply in-the-money options or when there is a very short time remaining until expiration. After market rallies, the call arbitrage may be easier to establish; after market declines, the put arbitrage will be easier to find. As an expiration date draws near, an option that is even slightly in-the-money on the last day or two of trading could be a candidate for discount arbitrage. The reason that this is true is that public buying interest in the option will normally wane. The only public buyers would be those who are short and want to cover. Many covered writers will elect to let the stock be called away, so that will reduce even further the buying potential of the public. This leaves it to the arbitrageurs to supply the buying interest.

The arbitrageur obviously wants to establish these positions in as large a size as possible, since there is no risk in the position if it is established at a discount. Usually, there will be a larger market for the stock than there will be for the options, so the arbitrageur spends more of his time on the option position. However, there may be occasions when the option markets are larger than the corresponding stock quotes. When this happens, the arbitrageur has an alternative available to him: *He might sell an in-the-money option at parity rather than take a stock position.*

Example: XYZ is at 58 and the XYZ July 50 call is at 7.90. These are the same figures as in the previous example. Furthermore, suppose that the trader is able to buy more options at 7.90 than he is able to sell stock at 58. If there were another in-the-money call that could be sold at parity, it could be used in place of the stock sale. For example, if the XYZ July 40 call could be sold at 18 (parity), the arbitrage could still be established. If he is assigned on the July 40 that he is short, he will then be short stock at a net price of 58—the striking price of 40, plus the 18 points that were brought in from the sale of the July 40 call. Thus, *the sale of the in-the-money call at parity is equivalent to shorting the stock for the arbitrage purpose.*

In a similar manner, an in-the-money put can be used in the basic put arbitrage.

Example: With XYZ at 58 and the July 70 put at 11.90, the arbitrage could be established. However, if the trader is having trouble buying enough stock at 58, he might be able to

use another in-the-money put. Suppose the XYZ July 80 put could be sold at 22. This would be the same as buying the stock at 58, because if the put were assigned, the arbitrageur would be forced to buy stock at 80—the striking price—but his net cost would be 80 minus the 22 points he received from the sale of the put, for a net cost of 58. Again, the arbitrageur is able to use the sale of a deeply in-the-money option as a substitute for the stock trade.

The examples above assumed that the arbitrageur sold a deeper in-the-money option at parity. In actual practice, if an in-the-money option is at a discount, an even deeper in-the-money option will generally be at a discount as well. The arbitrageur would normally try to sell, at parity, an option that was less deeply in-the-money than the one he is discounting.

In a broader sense, this technique is applicable to any arbitrage that involves a stock trade as part of the arbitrage, except when the dividend in the stock itself is important. *Thus, if the arbitrageur is having trouble buying or selling stock as part of his arbitrage, he can always check whether there is an in-the-money option that could be sold to produce a position equivalent to the stock position.*

DIVIDEND ARBITRAGE

Dividend arbitrage is actually quite similar to the basic put arbitrage. The trader can lock in profits by buying both the stock and the put, then waiting to collect the dividend on the underlying stock before exercising his put. *In theory, on the day before a stock goes ex-dividend, all puts should have a time value premium at least as large as the dividend amount.* This is true even for deeply in-the-money puts.

Example: XYZ closes at 45 and is going to go ex-dividend by $1 tomorrow. Then a put with striking price of 50 should sell for at least 6 points (the in-the-money amount plus the amount of the dividend), because the stock will go ex-dividend and is expected to open at 44, six points in-the-money.

If, however, the put's time value premium should be less than the amount of the dividend, the arbitrageur can take a riskless position. Suppose the XYZ July 50 put is selling for 5.90, with the stock at 45 and about to go ex-dividend by $1. The arbitrageur can take the following steps:

1. Buy the put at 5.90.
2. Buy the stock at 45.
3. Hold the put and stock until the stock goes ex-dividend (1 point in this case).
4. Exercise the put to sell the stock at 50.

The trader makes 5 points from the stock trade, buying it at 45 and selling it at 50 via the put exercise, and also collects the 1-point dividend, for a total inflow of 6 points. Since he loses the 5.90 points he paid for the put, his net profit is 10 cents.

Far in advance of the ex-dividend date, a deeply in-the-money put may trade very close to parity. Thus, it would seem that the arbitrageur could "load up" on these types of positions and merely sit back and wait for the stock to go ex-dividend. There is a flaw in this line of thinking, however, because *the arbitrageur has a carrying cost for the money that he must tie up in the long stock.* This carrying cost fluctuates with short-term interest rates.

Example: If the current rate of carrying charges were 6% annually, this would be equivalent to 1% every 2 months. If the arbitrageur were to establish this example position 2 months prior to expiration, he would have a carrying cost of .5075 point. (His total outlay is 50.90 points, 45 for the stock and 5.90 for the options, and he would pay 1% to carry that stock and option for the two months until the ex-dividend date.) This is more than 50 cents in costs—clearly more than the 10-cent potential profit. Consequently, the arbitrageur must be aware of his carrying costs if he attempts to establish a dividend arbitrage well in advance of the ex-dividend date. Of course, if the ex-dividend date is only a short time away, the carrying cost has little effect, and the arbitrageur can gauge the profitability of his position mostly by the amount of the dividend and the time value premium in the put option.

The arbitrageur should note that this strategy of buying the put and buying the stock to pick up the dividend might have a residual, rather profitable side effect. If the underlying stock should rally up to or above the striking price of the put, there could be rather large profits in this position. Although it is not likely that such a rally could occur, it would be an added benefit if it did. Even a rather small rally might cause the put to pick up some time premium, allowing the arbitrageur to trade out his position for a profit larger than he could have made by the arbitrage discount.

This form of arbitrage occasionally lends itself to a limited form of risk arbitrage. Risk arbitrage is a strategy that is designed to lock in a profit if a certain event occurs. If that event does not occur, there could be a loss (usually quite limited); hence, the position has risk. *This risk element differentiates a risk arbitrage from a standard, no-risk arbitrage.* Risk arbitrage is described more fully in a later section, but the following example concerning a special dividend is one form of risk arbitrage.

Example: XYZ has been known to declare extra, or special, dividends with a fair amount of regularity. There are several stocks that do so—Eastman Kodak and General Motors,

for example. In this case, assume that a hypothetical stock, XYZ, has generally declared a special dividend in the fourth quarter of each year, but that its normal quarterly rate is $1.00 per share. Suppose the special dividend in the fourth quarter has ranged from an extra $1.00 to $3.00 over the past five years. If the arbitrageur were willing to speculate on the size of the upcoming dividend, he might be able to make a nice profit. Even if he overestimates the size of the special dividend, he has a limited loss. Suppose XYZ is trading at 55 about two weeks before the company is going to announce the dividend for the fourth quarter. There is no guarantee that there will, in fact, be a special dividend, but assume that XYZ is having a relatively good year profitwise, and that some special dividend seems forthcoming. Furthermore, suppose the January 60 put is trading at 7.50. This put has 2.50 points of time value premium. If the arbitrageur buys XYZ at 55 and also buys the January 60 put at 7.50, he is setting up a risk arbitrage. He will profit regardless of how far the stock falls or how much time value premium the put loses, if the special dividend is larger than $1.50. A special dividend of $1.50 plus the regular dividend of $1.00 would add up to $2.50, thus covering his risk in the position. Note that $1.50 is in the low end of the $1.00 to $3.00 recent historical range for the special dividends, so the arbitrageur might be tempted to speculate a little by establishing this dividend risk arbitrage. Even if the company unexpectedly decided to declare no special dividend at all, it would most likely still pay out the $1.00 regular dividend. Thus, the most that the arbitrageur would lose would be 1.50 points (his 2.50-point initial time value premium cost, less the 1-point dividend). In actual practice, the stock would probably not change in price by a great deal over the next two weeks (it is a high-yield stock), and therefore the January 60 put would probably have some time value premium left in it after the stock goes ex-dividend. Thus, the practical risk is even less than 1.50 points.

While these types of dividend risk arbitrage are not frequently available, the arbitrageur who is willing to do some homework and also take some risk may find that he is able to put on a position with a small risk and a profitability quite a bit larger than the normal discount dividend arbitrage.

There is really not a direct form of dividend arbitrage involving call options. If a relatively high-yield stock is about to go ex-dividend, holders of the calls will attempt to sell. They do so because the stock will drop in price, thereby generally forcing the call to drop in price as well, because of the dividend. However, the holder of a call does not receive cash dividends and therefore is not willing to hold the call if the stock is going to drop by a relatively large amount (perhaps .75 points or more). The effect of these call holders attempting to sell their calls may often produce a discount option, and therefore a basic call arbitrage may be possible. The arbitrageur should be careful, however, if he is attempting to arbitrage a stock that is going ex-dividend on the following day. Since he must sell the stock to set up the arbitrage, he cannot afford to wind up the day being short

any stock, for he will then have to pay out the dividend the following day (the ex-dividend date). Furthermore, his records must be accurate, so that he exercises all his long options on the day before the ex-dividend date. If the arbitrageur is careless and is still short some stock on the ex-date, he may find that the dividend he has to pay out wipes out a large portion of the discount profits he has established.

CONVERSIONS AND REVERSALS

In the introductory material on puts, it was shown that put and call prices are related through a process known as conversion. This is an arbitrage process whereby a trader may sometimes be able to lock in a profit at absolutely no risk. *A conversion consists of buying the underlying entity, and also buying a put option and selling a call option such that both options have the same terms. This position will have a locked-in profit if the total cost of the position is less than the striking price of the options.*

It should be noted that the *underlying entity* and the terms of the options must agree, if this to be a riskless arbitrage. For example, if the options are for 150 shares of the underlying stock (presumably a 3-for-2 stock split occurred sometime in the recent past), then the arbitrage would consist of buying 150 shares of XYZ for each option established. As another example, if sometime in the recent past, XYZ had spun off 1 share of UVW stock for each share of XYZ owned, then certain options might be for 100 shares of XYZ *plus* 100 shares of UVW. In that case, the arbitrageur would have to buy 100 shares of XYZ *and* 100 shares of UVW for each option position established in those options whose terms included both stocks.

Example: The following prices exist:

XYZ common, 55;
XYZ January 50 call, 6.50; and
XYZ January 50 put, 1.

Suppose that these options are for 100 shares of XYZ. The total cost of this conversion is 49.50—55 for the stock, plus 1 for the put, less 6.50 for the call. Since 49.50 is less than the striking price of 50, there is a locked-in profit on this position. To see that such a profit exists, suppose the stock is somewhere above 50 at expiration. It makes no difference how far above 50 the stock might be; the result will be the same. With the stock above 50, the call will be assigned and the stock will be sold at a price of 50. The put will expire worthless. Thus, the profit is 50 cents, since the initial cost of the position was 49.50 and

it can eventually be liquidated for a price of 50 at expiration. A similar result occurs if XYZ is below 50 at expiration. In this case, the trader would exercise his put to sell his stock at 50, and the call would expire worthless. Again, the position is liquidated for a price of 50 and, since it only cost 49.50 to establish, the same 50-cent profit can be made. No matter where the stock is at expiration, this position has a locked-in-profit of 50 cents.

This example is rather simplistic because it does not include two very important factors: the possible dividend paid by the stock and the cost of carrying the position until expiration. The inclusion of these factors complicates things somewhat, and its discussion is deferred momentarily while the companion strategy, the reversal, is explained.

A reversal (or reverse conversion, as it is sometimes called) is exactly the opposite of a conversion. *In a reversal, the trader sells the underlying entity short, sells a put, and buys a call.* Again, the put and call have the same terms. *A reversal will be profitable if the initial credit (sale price) is greater than the striking price of the options.*

Example: A different set of prices will be used to describe a reversal:

XYZ common, 55;
XYZ January 60 call, 2; and
XYZ January 60 put, 7.50.

Suppose that these options are for 100 shares of XYZ. The total credit of the reversal is 60.50—55 from the stock sale, plus 7.50 from the put sale, less the 2-point cost of the call. Since 60.50 is greater than the striking price of the options, 60, there is a locked-in profit equal to the differential of 50 cents. To verify this, first assume that XYZ is anywhere below 60 at January expiration. The put will be assigned—stock is bought at 60—and the call will expire worthless. Thus, the reversal position is liquidated for a cost of 60. A 50-cent profit results since the original sale value (credit) of the position was 60.50. On the other hand, if XYZ were above 60 at expiration, the trader would exercise his call, thus buying stock at 60, and the put would expire worthless. Again, he would liquidate the position at a cost of 60 and would make a 50-cent profit.

Dividends and carrying costs are important in reversals, too; these factors are addressed here. The conversion involves buying stock, and the trader will thus receive any dividends paid by the stock during the life of the arbitrage. However, the converter also has to pay out a rather large sum of money to set up his arbitrage, and must therefore deduct the cost of carrying the position from his potential profits. In the example

above, the conversion position cost 49.50 points to establish. If the trader's cost of money were 6% annually, he would thus lose .06/12 × 49.50, or .2475 point per month for each month that he holds the position. This is nearly 25 cents per month. Recall that the potential profit in the example is 50 cents, so that if one held the position for more than two months, his carrying costs would wipe out his profit. *It is extremely important that the arbitrageur compute his carrying costs accurately prior to establishing any conversion arbitrage.*

If one prefers formulae, the profit potentials of a conversion or a reversal can be stated as:

Conversion profit = Striking price + Call price − Underlying price − Put price + Dividends to be received − Carrying cost of position

Reversal profit = Underlying + Put − Strike − Call + Carrying cost − Dividends

Note that during any one trading day, the only items in the formulae that can change are the prices of the securities involved. The other items, dividends and carrying cost, are fixed for the day. Thus, one could have a small computer program prepared that listed the fixed charges on a particular stock for all the strikes on that stock.

Example: It is assumed that XYZ stock is going to pay a 50-cent dividend during the life of the position, and that the position will have to be held for three months at a carrying cost of 6% per year. If the arbitrageur were interested in a conversion with a striking price of 50, and the options are for 100 shares of XYZ, his fixed cost would be:

$$\begin{aligned}\text{Conversion fixed cost} &= \text{Carrying rate} \times \text{Time held} \times \text{Striking price} - \text{Dividend to be received} \\ &= .06 \times 3/12 \times 50 - .50 \\ &= .75 - .50 = .25\end{aligned}$$

The arbitrageur would know that if the profit potential, computed in the simplistic manner using only the prices of the securities involved, was greater than 25 cents, he could establish the conversion for an eventual profit, including all costs. Of course, the carrying costs would be different if the striking price were 40 or 60, so a computer printout of all the possible striking prices on each stock would be useful in order for the trader to be able to refer quickly to a table of his fixed costs each day.

MORE ON CARRYING COSTS

The computation of carrying costs can be made more involved than the simple method used above. Simplistically, the carrying cost is computed by multiplying the debit of the position by the interest rate charged and the time that the position will be held. That is, it could be formulated as:

$$\text{Carrying cost} = \text{Strike} \times r \times t$$

where r is the interest rate and t is the time that the position will be held. Relating this formula for the carrying cost to the conversion profit formula given above, one would get:

$$\begin{aligned}\text{Conversion profit} &= \text{Call} - \text{Underlying} - \text{Put} + \text{Dividend} + \text{Strike} - \text{Carrying cost} \\ &= \text{Call} - \text{Underlying} - \text{Put} + \text{Dividend} + \text{Strike}\,(1 - rt)\end{aligned}$$

In an actuarial sense, the carrying cost could be expressed in a slightly more complex manner. The simple formula (strike x r x t) ignores two things: the compounding effect of interest rates and the "present value" concept (the present value of a future amount). The absolutely correct formula to include both present value and the compounding effect would necessitate replacing the factor strike (1—rt) in the profit formula by the factor

$$\frac{\text{Strike}}{(1+r)^t}$$

Is this effect large? No, not when r and t are small, as they would be for most option calculations. The interest rate per month would normally be less than 1%, and the time would be less than 9 months. Thus, it is generally acceptable, and is the common practice among many arbitrageurs, to use the simple formula for carrying costs. In fact, this is often a matter of convenience for the arbitrageur if he is computing the carrying costs on a hand calculator that does not perform exponentiation. However, in periods of high interest rates when longer-term options are being analyzed, the arbitrageur who is using the simple formula should double-check his calculations with the correct formula to assure that his error is not too large.

For purposes of simplicity, the remaining examples use the simple formula for carrying-cost computations. The reader should remember, however, that it is only a convenient approximation that works best when the interest rate and the holding period are small. This discussion of the compounding effect of interest rates also raises another interesting point: Any investor using margin should, in theory, calculate his potential

interest charge using the compounding formula. However, as a matter of practicality, extremely few investors do. An example of this compounding effect on a covered call write is presented in Chapter 2.

BACK TO CONVERSIONS AND REVERSALS

Profit calculation similar to the conversion profit formula is necessary for the reversal arbitrage. Since the reversal necessitates shorting stock, the trader must pay out any dividends on the stock during the time in which the position is held. However, he is now bringing in a credit when the position is established, and this money can be put to work to earn interest. In a reversal, then, the dividend is a cost and the interest earned is a profit.

Example: Use the same XYZ details described above: The stock is going to pay a 50-cent dividend, the position will be held for three months, and the money will earn interest at a rate of ½ of 1% per month. If the trader were contemplating an arbitrage with a striking price of 30, the fixed cost would be:

$$\begin{aligned}\text{Reversal fixed cost} &= \text{Dividend to be paid} - \text{Interest rate per month} \times \\ &\quad \text{Months held} \times \text{Striking price} \\ &= .50 - .005 \times 3 \times 30 \\ &= .50 - .045 = .005 \text{ point}\end{aligned}$$

The fixed cost in this reversal is extremely small. In fact, the reader should be able to see that it is often possible—even probable—that there will be a fixed credit, not a fixed cost, in a reversal arbitrage. To verify this, rework the example with a striking price of 50 or 60. As in a conversion, the fixed cost (or profit) in a reversal is a number that can be used for the entire trading day. It will not change.

BORROWING STOCK TO SELL SHORT

The above example assumes that the arbitrageur earns the full carrying rate on the short stock. Only certain arbitrageurs are actually able to earn that rate. When one sells stock short, he must actually borrow the stock from someone who owns it, and then the seller goes into the market to sell the stock. When customers of brokerage firms keep stock in a margin account, they agree to let the brokerage firm loan their stock out without the

customer's specific approval. Thus, if an arbitrageur working for that brokerage firm wanted to establish a reversal, and if the stock to be sold short in the reversal were available in one of the margin accounts, the arbitrageur could borrow that stock and earn the full carrying rate on it. This is called "using box stock," since stock held in margin accounts is generally referred to as being in the "box."

There are other times, however, when an arbitrageur wants to do a reversal but does not have access to "box" stock. He must then find someone else from whom to borrow the stock. Obviously, there are people who own stock and would loan it to arbitrageurs for a fee. There are people who specialize in matching up investors with stock to loan and arbitrageurs who want to borrow stock. These people are said to be in the "stock loan" business. Generally, the fee for borrowing stock in this manner is anywhere from 10 to 20% of the prevailing carrying cost rate. For example, if the current carrying rate were 10% annually, then one would expect to pay 1 or 2% to the lender to borrow his stock. This reduces the profitability of the reversal slightly. Since small margins are being worked with, this cost to borrow the stock may make a significant difference to the arbitrageur.

These variations in the rates that an arbitrageur can earn on the credit balances in his account affect the marketplace. For example, a particular reversal might be available in the marketplace at a net profit of 50 cents. Such a reversal may not be equally attractive to all arbitrageurs. Those who have "box" stock may be willing to do the reversal for 50 cents; those who have to pay 1% to borrow stock may want 0.55 for the reversal; and those who pay 2% to borrow stock may need 0.65 for the reversal. Thus, arbitrageurs who do conversions and reversals are in competition with each other not only in the marketplace, but in the stock loan arena as well.

Reversals are generally easier positions for the arbitrageur to locate than are conversions. This is because the fixed cost of the conversion has a rather burdensome effect. Only if the stock pays a rather large dividend that outweighs the carrying cost could the fixed portion of the conversion formula ever be a profit as opposed to a cost. In practice, the interest rate paid to carry stock is probably higher than the interest earned from being short stock, but any reasonable computer program should be able to handle two different interest rates.

The novice trader may find the term "conversion" somewhat illogical. In the over-the-counter option markets, the dealers create a position similar to the one shown here as a result of actually converting a put to a call.

Example: When someone owns a conventional put on XYZ with a striking price of 60 and the stock falls to 50, there is often little chance of being able to sell the put profitably in the secondary market. The over-the-counter option dealer might offer to convert the put into a call. To do this, he would buy the put from the holder, then buy the stock itself, and then offer a call at the original striking price of 60 to the holder of the put. Thus, the

dealer would be long the underlying, long the put, and short the call—a conversion. The customer would then own a call on XYZ with a striking price of 60, due to expire on the same date that the put was destined to. The put that the customer owned has been converted into a call. To effect this conversion, the dealer pays out to the customer the difference between the current stock price, 50, and the striking price, 60. Thus, the customer receives $1,000 for this conversion. Also, the dealer would charge the customer for costs to carry the stock, so that the dealer had no risk. If the stock rallied back above 60, the customer could make more money, because he owns the call. The dealer has no risk, as he has an arbitrage position to begin with. In a similar manner, the dealer can effect a reverse conversion—converting a call to a put—but will charge the dividends to the customer for doing so.

RISKS IN CONVERSIONS AND REVERSALS

Conversions and reversals are generally considered to be riskless arbitrage. That is, the profit in the arbitrage is fixed from the start and the subsequent movement of the underlying makes no difference in the eventual outcome. This is generally a true statement. However, there are some risks, and they are great enough that one can actually lose money in conversions and reversals if he does not take care. The risks are fourfold in reversal arbitrage: An extra dividend is declared, the interest rate falls while the reversal is in place, an early assignment is received, or the stock is exactly at the striking price at expiration. Converters have similar risks: a dividend cut, an increase in the interest rate, early assignment, or the stock closing at the strike at expiration.

These risks are first explored from the viewpoint of the reversal trader. If the company declares an extra dividend, it is highly likely that the reversal will become unprofitable. This is so because most extra dividends are rather large—more than the profit of a reversal. There is little the arbitrageur can do to avoid being caught by the declaration of a truly extra dividend. However, some companies have a track record of declaring extras with annual regularity. The arbitrageur should be aware of which companies these are and of the timing of these extra dividends. A clue sometimes exists in the marketplace. If the reversal appears overly profitable when the arbitrageur is first examining it (before he actually establishes it), he should be somewhat skeptical. Perhaps there is a reason why the reversal looks so tempting. An extra dividend that is being factored into the opinion of the marketplace may be the answer.

The second risk is that of variation in interest rates while the reversal is in progress. Obviously, rates can change over the life of a reversal, normally 3 to 6 months. There are two ways to compensate for this. The simplest way is to leave some room for rates to move.

For example, if rates are currently at 12% annually, one might allow for a movement of 2 to 3% in rates, depending on the length of time the reversal is expected to be in place. In order to allow for a 2% move, the arbitrageur would calculate his initial profit based on a rate of 10%, 2% less than the currently prevailing 12%. He would not establish any reversal that did not at least break even with a 10% rate. The rate at which a reversal breaks even is often called the "effective rate"—10% in this case. Obviously, if rates average higher than 10% during the life of the reversal, it will make money. Normally, when one has an entire portfolio of reversals in place, he should know the effective rate of each set of reversals expiring at the same time. Thus, he would have an effective rate for his 2-month reversals, his 3-month ones, and so forth.

Allowing this room for rates to move does not necessarily mean that there will not be an adverse affect if rates do indeed fall. For example, rates could fall further than the room allowed. Thus, a further measure is necessary in order to completely protect against a drop in rates: One should invest his credit balances generated by the reversals in interest-bearing paper that expires at approximately the same time the reversals do, and that bears interest at a rate that locks in a profit for the reversal account. For example, suppose that an arbitrageur has $5 million in 3-month reversals at an effective rate of 10%. If he can buy $5 million worth of 3-month Certificates of Deposit with a rate of 11½%, then he would lock in a profit of 1½% on his $5 million. This method of using paper to hedge rate fluctuations is not practiced by all arbitrageurs; some think it is not worth it. They believe that by leaving the credit balances to fluctuate at prevailing rates, they can make more if rates go up, and that will cushion the effect when rates decline.

The third risk of reversal arbitrage is reception of an early assignment on the short puts. This forces the arbitrageur to buy stock and incur a debit. Thus, the position does not earn as much interest as was originally assumed. If the assignment is received early enough in the life of the reversal (recall that in-the-money puts can be assigned very far in advance of expiration), the reversal could actually incur an overall loss. Such early assignments normally occur during bearish markets. The only advantage of this early assignment is that one is left with unhedged long calls; these calls are well out-of-the-money and normally quite low-priced (.25 or less). If the market should reverse and turn bullish before the expiration of the calls, the arbitrageur may make money on them. There is no way to hedge completely against a market decline, but it does help if the arbitrageur tries to establish reversals with the call in-the-money and the put out-of-the-money. That, plus demanding a better overall return for reversals near the strike, should help cushion the effects of the bear market.

The final risk is the most common one, that of the stock closing exactly at the strike at expiration. This presents the arbitrageur with a decision to make regarding exercise of his long calls. Since the stock is exactly at the strike, he is not sure whether he will be