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WHAT'S THE U.S. DOLLAR'S NEXT MOVE?

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FX OPTIONS TRADING STRATEGIES POSTER

Stuck in a trading rut? Scalping option gammas is an active option position management technique that extracts profits in midstream where you might have thought there weren't any.

Scalping option gammas

BY DEAN MOUSCHER

Consider this market scenario: Treasury bond futures are in a period of low volatility, with a daily range of half a point or less. The options on these futures are trading at historically low implied volatility. With the futures at exactly 112, you decide to buy a 50-lot in 112 straddles (50 calls and 50 puts at the 112 strike). There are 45 days remaining until expiration.

The next day, the markets go wild. The daily range expands by two to three points for the next few months. Nevertheless, at expiration the futures are again at 112 — exactly where they were 45 days earlier when you bought the straddles, and exactly at-the-money. Your straddles expire worthless.

The question is, did you make money or lose money?

If you said, "of course I lost money, my straddles expired worthless," then it's time you learned how to scalp your gammas.

SOMETHING FROM NOTHING

Scalping gammas is a professional position-management technique in which your long options (long premium) position allows you to make money buying and selling the underlying, with no risk of it ever moving against you. To the contrary, every move of the underlying makes you money. Using it in our scenario, you could have made a small fortune.

To see how it works, let's return to our initial scenario. These are our assumptions: a risk-free interest rate of 4%, an implied volatility of 6% and, as we said, 45 days remaining until expiration. T-bond futures are at exactly 112. Each 112 call and each 112 put are offered at $937.50, for a total price of $93,750.00 for the 50 straddles.

Using your options analysis software, you look up the delta and gamma values for these options. Delta is the percent an option's value changes as the underlying moves. Gamma reflects how much the delta of the option changes when the price of the underlying changes by one point. The larger the gamma, the more the delta can change for even a small move in the underlying. In the case of our example position, each call has a delta of about 0.5 and each put a delta of about -0.5, so your position is delta neutral. Each call and each put has a gamma of 0.17, so the entire position has a total gamma of 17 (100 options times 0.17 gammas per option). We'll see what that means in a moment.

The day after you buy these options, T-bond futures go up one point, to 113. Assuming that implied volatility remains unchanged, your software now shows each call is worth $1,516, and each put is worth $531, for a total position value of $102,350. This equates to a gross profit of $8,600.

Now things really get interesting. You are no longer delta neutral. Your software shows that each call now has a delta of 0.67 and each put a delta of -0.33, so your total position delta is now roughly 17.

That happened because whenever you buy an option (put or call) the most important thing you're buying is the wonderful property (unique to options) that as the underlying contract or stock moves, the delta of your option changes in the direction that is favorable to you. As the underlying moves up, the delta of calls becomes

increasingly more positive, and the delta of puts becomes less negative. As the underlying moves down, the delta of puts becomes increasingly more negative, and the delta of calls becomes less positive.

When the straddles were bought, the calls had a delta of 0.5 and the puts a delta of -0.5. The puts and the calls each had a gamma of 0.17. After the one-point move from 112 to 113, each call now has a delta of 0.67. That is equal to 0.5 + 0.17, just as the gamma predicted. Each put now has a delta of -0.33, which is -0.5 + 0.17, again just as the gamma foresaw. The total position gamma was 17 and, sure enough, the total position delta went from 0 to positive 17.

Of course, had the futures gone from 112 down to 111, to get the new delta of each option you'd have to subtract 0.17. The total position delta would now be about -17. And, just as when the futures went up a point, you would have a profit of approximately $8,600 (slightly less actually, see "The asymmetry of options," in "Option trading facts," page 40).

ACTION TIME

Now, this scenario has us long 50 straddles at a strike of 112, which were bought when the futures were at 112. The futures have now risen one point to 113. The total position delta has increased from 0 to 17, and the position has a profit of $8,600. That's not bad for a day's work.

But any reasonable trader might be a bit nervous. After all, if the futures go back down to 112, that profit evaporates, right?

Not necessarily. You can lock in your profit by selling short 17 futures contracts. This brings you back to delta neutral. And that's what scalping gammas is all about.

Think of it this way: With the futures at 113, you are long 17 deltas, the equivalent of being long 17 futures contracts. So you have the "right" to sell 17 futures contracts to become delta neutral again. When you do, you've locked in your profit. If the futures go back down to 112, you're back where you started as far as the options are concerned, but you have a $17,000 profit on your futures sale. You made $8,600 on the way up, and about the same on the way down.

This is where you might wonder what happens if the futures keep going up. You are short 17 contracts.

No problem. You're long volatility. With a long volatility position, any movement of the underlying (up or down) is your best friend.

If the futures go a point higher to 114, each call should now reflect a value of $2,250, and each put is worth $265, for a total value on your options of $125,750. This is an increase of $23,400 over the options' value when the futures were at 113. You have a loss of $17,000 on the futures that were sold short at 113, but you still made an overall profit of $6,400 ($23,400 minus $17,000) on the trip from 113 to 114.

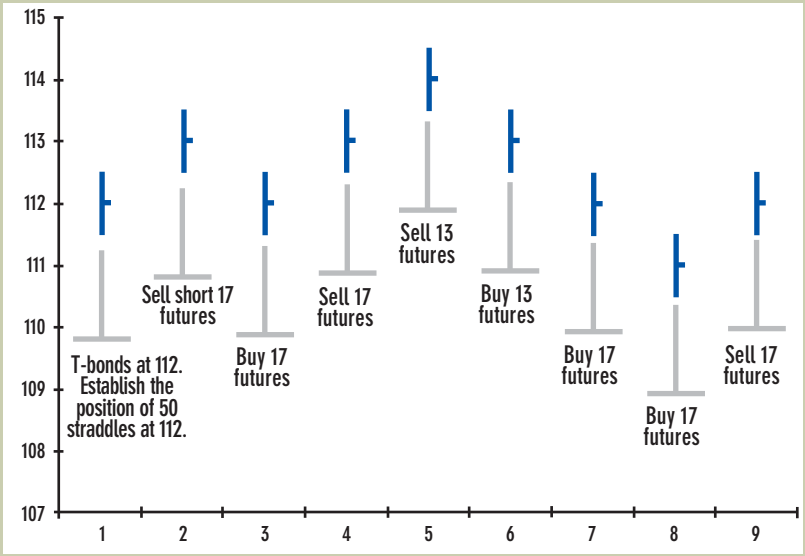
The option analysis software now shows a total delta on the options of 30. Subtract the 17 futures you sold short, and you have a total position delta of 13. You can lock in your profit again with a futures transaction that brings you back to delta neutral. In this case, you sell short 13 more futures contracts.

If the futures continue going higher, you'll continue to make more money on your options than you'll lose on your short futures, although the rate of profit will keep declining the further away the futures get from the original strike price.

That scenario examined what would happen if the underlying con-

POSITION MANAGEMENT

Every time the underlying makes a significant move, by making a futures transaction, you return to delta neutrality.



Follow your plan, or you'll keep doing today what you regret not having done yesterday, and you'll drive yourself crazy.

Option trading facts

BY DEAN MOUSCHER

THE RIGHT INTEREST RATE

One of the most frequent questions that comes up in options seminars is: What is the correct interest rate to use when calculating theoretical option prices and implied volatilities? The answer: *Your* interest rate.

If you bought options with money you would otherwise have put in three-month Treasury bills, then use the three-month T-bill rate. If you sold options short and your broker is paying you 2% on the resulting credit balance, use 2%. If you bought options with money you would have used to pay down your 7% mortgage, use 7%.

And if you bought those options with money you borrowed from Louie the Loan Shark at 240% interest (not recommended, by the way), then 240% is the correct number to use.

THE ASYMMETRY OF OPTIONS

It would seem logical that if the futures are at 112, a 113 call would be worth the same as a 111 put. After all, they're both one point out-of-the-money. But in reality, the 113 call is worth more. That's because your option pricing model takes into account the fact that the downside is limited — the underlying can only go down to zero — while the upside is theoretically infinite.

To understand, think of silver when it was trading at $5 an ounce. Which would you rather own, a $1 put, or a $9 call? Intuitively, you probably answered a $9 call, and you'd be right.

Statistically, it is "harder" for the price to go from $5 down to $1 than from $5 up to $9. A move from $5 to $4 is a 20% move. To get from $4 to $3 requires a 25% move, from $3 to $2, a 33% move, and from $2 to $1, a 50% move. Going from $5 to $6 also requires a 20% move, but from $6 to $7 only requires a 17% move, from $7 to $8, a 14% move, and from $8 to $9 just a 12.5% move.

That's the basis of the asymmetrical "lognormal distribution" used in most option pricing models. It's also the reason that if the underlying is at 112, the delta of a 112 call will be slightly above 0.5, and the delta of a 112 put will be slightly below 0.5.

SHORTING VOLATILITY

When you're short premium (short volatility) — say that you sold short 50, 112 straddles with the underlying at 112 — then with every move in the underlying you lose money, your deltas move against you, and every time you buy or sell the underlying to return to delta neutral you're locking in a loss. This is exactly the opposite of being long volatility.

The short-premium game is to keep your cool, and hope that each move of the underlying away from the strike price is temporary. If you can take the pain and refrain from evening up your deltas, and if the underlying does expire near your strike price, you will be handsomely rewarded. But if the underlying makes a big move…ouch!

Premium sellers make money more often than not because most of the time, nothing much happens in the markets. But when the markets get roiled and things move, losses can be huge.

tract rose. Consider what would happen if, instead of rising, the underlying contract went down. If the futures fell from 112 to 111 right after the initial purchase, the 112 calls would be worth $516 and the 112 puts would be worth $1,516, for a total position value of $101,600 and a profit of $7,850, a bit less than you made on the way up. The delta of the 112 call would now be 0.33 and the delta of the 112 put would be -0.67, for a total position delta of -17.

As before, you can lock in your profit with a futures transaction, this time by buying 17 contracts. If the futures go right back up to 112, you're back where you started as far as the straddles are concerned, but you're up $17,000 on the futures trade. If, after you bought those 17 futures contracts at 111, the futures continued down to 110, your 112 calls would be worth $250 each and your 112 puts would be worth $2,250 each, for a total position value of $125,000. That's a further increase in options value from $101,600 to $125,000, or $23,400. Subtract the $17,000 you lost on the 17 futures contracts you bought at 111, and you still pocketed $6,400 on the decline from 111 to 110.

All of which brings up the three axioms of gamma scalping. When you start out with a position that is delta neutral and long gamma: every time the underlying moves, up or down, you make a profit; every time the underlying moves up, your position's delta increases, and every time the underlying moves down, your position's delta decreases; and every time you buy or sell the underlying to become delta neutral again, you're locking in a profit.

To further understand, consider this executive summary of a gamma-scalping scenario (also see, "Position management," page 39). With the T-bond futures at 112, you start out long 50, 112 straddles and delta neutral. T-bonds go up to 113; you sell short 17 futures. They go back down to 112, you buy 17 futures. They go up to 113,

you sell 17 futures. They go up to 114, you sell 13 more futures. They go back down to 113, you buy 13 futures. They go down to 112, you buy 17 futures. They go down to 111, you buy 17 more futures. They go back up to 112, you sell 17 futures.

It might sound busy (it is), but each time you bought or sold futures in the above scenario, you returned to delta neutral and locked in a profit. That's scalping gammas, using your long-gamma option position to make money buying and selling futures, by eliminating the risk of the underlying moving against you. Once you return to delta-neutral, you make money if the underlying goes up or down.

THE DOWNSIDE

This strategy isn't meant to imply that buying straddles can be made risk-free. Whenever you're long premium (long volatility), you lose money if implied volatility falls. You also lose money if real volatility drops and you can't scalp gammas enough to offset time decay.

So while any movement of the underlying is good, lack of movement hurts you. Again, that's what it means to be long volatility.

The hardest part of this strategy is knowing when to even up your deltas. If you water your lawn, you can be sure it will rain and, by the same token, if you sell those 17 futures contracts at 113, it's a sure thing that the futures will continue up to 114. If you're like most people, you'll kick yourself for having sold those futures too soon. You'll vow not to make the same mistake twice, and to refrain from selling any more futures contracts until they get up to, say, 115. Of course, the futures will then turn around and go back down to 113, and you'll have not a penny to show for that last beautiful one-point move from 113 to 114 and back.

It's inevitable when scalping gammas that you'll rarely catch the exact turning points. The best advice is to determine a fixed strategy — such as scalping every point up or down, for example — and just stick with it. Follow your plan, or you'll keep doing today what you regret not having done yesterday, and you'll drive yourself crazy.

To the professional options trader, options are a way to play volatility rather than the direction of the underlying. Whenever you are long volatility (long options, long premium, long gammas) it's a race of volatility against time — the money you can make scalping gammas vs. the money you lose from time decay.

If you buy fairly priced options, you'll make about the same money scalping gammas as you'll lose from time decay. If you buy overpriced options — options that have implied volatility higher than the underlying's actual volatility would justify — you will lose more in time decay every day than you can make scalping gammas. In that situation, you'd be better off selling volatility short (if you have the nerves for it, see "Shorting volatility," in "Option trading facts," left).

But if you can find options that are underpriced — that is, trading at an implied volatility significantly below the true volatility — then scalping gammas will allow you to profit from the discrepancy. It also will let you profit from correctly guessing that true volatility will increase, as in our example. It doesn't even matter if the implied volatility never rises along with the actual volatility.

Scalping gammas also will allow you to offset time decay if you've bought option premium hoping for a big move, while waiting for the move to come. **FM**

Dean Mouscher was a long-time member of the Chicago Board of Trade (CBOT) and Chicago Mercantile Exchange. He traded options on the floor of both exchanges for many years. He has taught many option courses at the CBOT and other exchanges and private firms in the United States and abroad. E-mail him at dmo25@comcast.net.