

# Options on CBOT® Fed Funds Futures

## ANTICIPATING FED ACTION

Options on CBOT fed funds futures are quite possibly the best means available to express market opinions about what the Fed might or might not do at upcoming meetings. Trading on a monthly expiration cycle and linked directly to the fed funds effective rate published by the Federal Reserve Bank of New York in the H.15 report, CBOT fed funds futures have long been recognized as an effective means of keeping track of the market consensus concerning what the Fed might do next. In addition to that, when you have opinions both about what the Fed might do and the volatility of this market, these options make possible a range of trading strategies well suited to expressing a variety of market opinions.

### Choose the Right Option

In the past, the option of choice for taking positions on expected Fed action has been Eurodollar options. Exhibit 1 shows that options on CBOT fed funds futures will allow you to focus more sharply on projected Fed action.

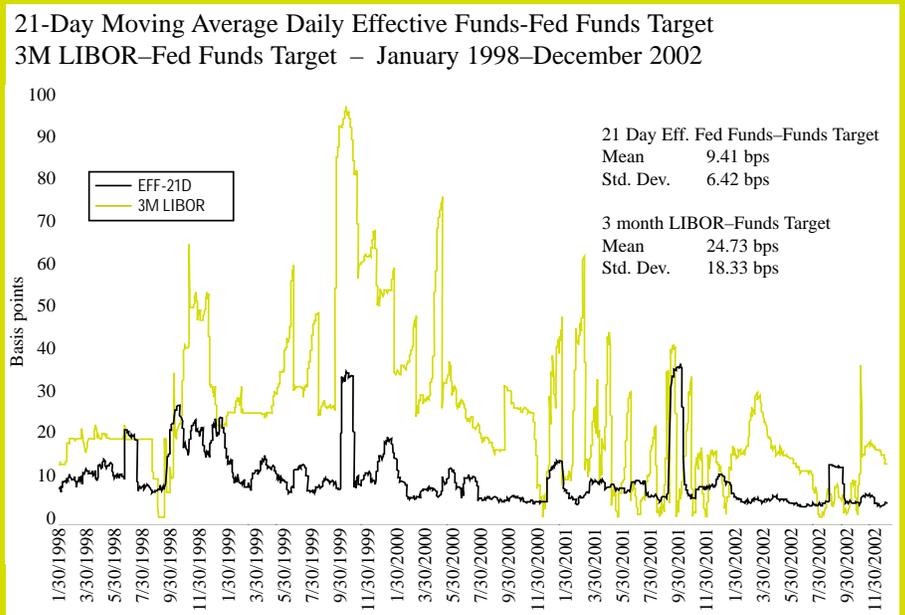
This study is based on 5 years of daily interest rate data. It contrasts the spread between a 21-day moving average of the actual fed funds effective rate and the Fed target rate on the one hand and between 3-month LIBOR (the basis for Eurodollar futures pricing) and the Fed target rate on the other hand. The graphic representation of Exhibit 1 makes easily apparent what the statistics of this study reveal. Specifically, the fed funds effective rate spread to the Fed target rate has a 9.41 basis point (bp) mean and a 6.42 bp standard deviation. This

contrasts sharply with the 24.73 bp mean of the spread between 3-month LIBOR and the Fed target rate and the 18.33 standard deviation of this spread. Granted, these two interest rates are not exactly comparable. Nevertheless, this kind of evidence makes a strong case for using options on CBOT fed funds futures to express your opinion about what the Fed might do at a given future meeting.

### Contract Characteristics

The pricing of CBOT fed funds futures gives this market unique volatility characteristics that must be factored into your options trading decisions. Expiration month prices of these futures are an average of the daily fed funds effective rate. Because of this, they exhibit less variability as the

**Exhibit 1: Tracking the Fed**



month progresses. Accordingly, Fed meetings that occur after the middle of the month can have little effect on the futures price.

More to the point for options traders, this dampens expiration month volatility. This contrasts sharply with the volatility patterns you are used to seeing in other markets where volatility tends to increase as option expiration approaches. This must be kept in mind in planning trades involving options on CBOT fed funds futures.

Often, when the Fed meeting will be mid-month or later, it is the price of the next month that expresses the market consensus. For example, given a June 26 meeting, you would look at the July contract for helpful information. Placing a trade in that expiration, rather than the expiration containing the meeting (that is, on the July rather than the June contract in this example) may prove an effective means of sidestepping this volatility issue.

### Reading the Market

CBOT fed funds futures price spreads provide a means of gauging the market's expectations concerning future Fed policy action. This can provide major help in planning an options trade, for the spreads not only show what the market expects but they also indicate how much of the move is already priced in the market. Obviously, if the market expects a certain move and the relevant futures price shows that move is already in the market, there is less of a trading opportunity—unless you have a different idea.

For example, in early September of 2002, you could have seen the CBOT fed funds futures price array shown in Exhibit 2 which tells you that the market does not anticipate Fed action at any of the fourth quarter meetings.

**Exhibit 2: The Market Identifies a Neutral Fed**

	Futures Price	Implied Rate	Spread
Sep	98.28	1.72	—
Oct	98.35	1.65	-0.07
Nov	98.41	1.59	-0.06
Dec	98.44	1.56	-0.03

To find the implied fed funds rate, subtract the price from 100. The spreads are the month-to-month differences between implied rates. Typically, when the spreads are 9 bps or less, they indicate that the market expects no Fed action. A dislocation to a spread of 12 or 15 bps, or more, indicates that the market does anticipate a Fed move after a particular meeting.

Such a spread widening occurred only a month after the Exhibit 2 snapshot was taken. The sign of this shift in the market consensus is the 15 bp Oct-Nov spread in Exhibit 3, which lies well outside the normal 4-8 bp range. This suggests that by the beginning of November, the market had decided the Fed would ease 25 bps at its November 6, 2002 meeting.

**Exhibit 3: The Market Expects a 25 Basis Point Ease**

	Futures Price	Implied Rate	Spread
Oct	98.31	1.69	—
Nov	98.46	1.54	-0.15
Dec	98.56	1.44	-0.10
Jan	98.60	1.40	-0.04

Note that this does not say the Fed will ease but only that this is the market consensus expectation. It is this that creates the speculative opportunity for an options trader, for your personal market analysis may lead to a different conclusion.

### A Long Option Position

The simplest way to trade your opinion about what the Fed might do is to go long an option. When you expect yields to fall, the relevant trade is a long call position, for falling yields will drive futures prices higher (if the move is not already in the market). When you expect yields to rise, the relevant trade is a long put position, for rising yields will drive futures prices lower. However, being long an option may be risky in terms of volatility.

Suppose your analysis of the economic situation had led you to conclude that the economy was faltering enough that the Fed would ease 50 bps rather than the 25 bps Exhibit 3 shows the market to be expecting. Had this been your belief, and had options on CBOT fed funds futures been available, you could have considered buying a call on November 2002 CBOT fed funds futures.

The logic of this is straightforward. The November 2002 futures prices that you would have seen in early October 2002 and right before the November 6, 2002 Fed meeting were in the 98.45 range and implied a 1.55 fed funds rate. That much ease was already priced into the market. If the Fed were to lower its fed funds target rate to 1.25, the 50 bp ease you expect, the price of the November 2002 futures would rise to at least approach 98.75.

In this case, if you had bought the 98.50 call and the futures price had gone to 98.75, your option would have gone 25 bps into the money. These options have a quarter basis point tick size which is worth \$10.4175. Thus, the 25 bps of intrinsic option value would have been worth \$1,041.75.

### A Short Option Position

Suppose that in early February 2003, the market had priced in a tightening at the late March Fed meeting (in fact, it had not; this is a strictly hypothetical scenario). When the meeting falls after the middle of the month, the tell-tale spread is between the meeting month and the month following. Exhibit 4 shows a possible spread. The 15 bp Mar-Apr spread is the one that indicates the market expectation of a tightening.

**Exhibit 4: The Market Expects Tightening**

	Futures Price	Implied Rate	Spread
Feb	98.77	1.23	—
Mar	98.75	1.25	0.02
Apr	98.60	1.40	0.15
May	98.55	1.45	0.05

Suppose, further, that you believe that the market has overestimated the potential for economic growth and that the Fed will leave rates unchanged at its March meeting. In this case, you might decide you want to be long the market by either selling a put or buying a call on April 2003 fed funds futures. In setting up such a trade, along with deciding which option to trade, you must choose which strike price to trade.

Your choices will be based upon your outlook on volatility as well as monetary policy. Due to the unique characteristics of CBOT fed funds futures, options on these futures may have a unique volatility skew that is

relatively flat, and puts and calls are likely to appear rich or cheap depending upon whether the Fed is in a tightening or easing cycle. These are some factors to consider in your decision of whether to be long or short an option and which strike price to trade.

Suppose you expect a drop in volatility to follow the Fed not tightening at the late March meeting. Moreover, you believe the risk of a 50 bp tightening at the March meeting is small. If you are willing to take the risks associated with selling an option, you might choose to sell the April 2003 98.5625 puts because:

- They are expensive relative to the 98.50 puts as a result of the market expectation for a 25 bp move.
- You are willing to take the risk of losing as much as 6.25 bps more than you would with the lower strike price.

If you are right about the Fed not tightening, the April 2003 futures price will rise to a level close to 98.75. Further, even though you've placed your trade in the April 2003 option contract, the volatility is likely to drop sharply right after the late March meeting and stay there. The interaction of the price and volatility should have allowed you to collect most of the initial premium you received when you sold the put.

### A Synthetic Binary Option

One of the features of options on CBOT fed funds futures is that they have 6 1/4 bp strike price intervals. That means that between 98.75 and 99.00, there are three strike prices available: 98.8125, 98.875, and 98.9375. In general, these options should vary only slightly in price.

Suppose you believe that, with the fed funds target rate at 1.25%, there is some chance the Fed will ease at its next meeting, but this has not been priced into the market. At the same time, given the low level of the current target rate, you believe the Fed is running out of maneuvering room and is unlikely to ease more than 25 bps. Anticipating an ease, you might also want a strategy that will pay a fixed amount if the Fed does ease but will pay nothing otherwise.

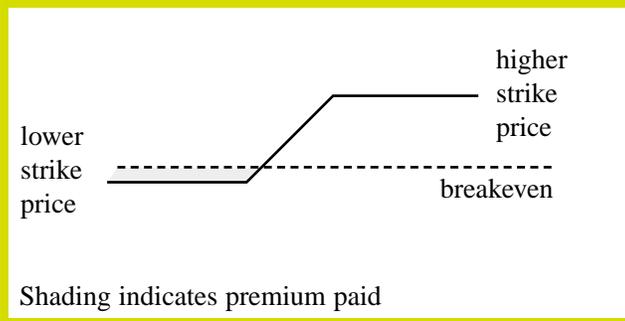
Given this outlook and this risk-reward preference, you can use options on CBOT fed funds futures to synthesize what the over-the-counter people call a binary option. A binary option is really nothing more than a vertical spread with strike prices very close together. These options pay a small amount if the event in question happens and do nothing if the event does not. But note that this strategy

will only work when a Fed move has not already been priced into the market.

To create this kind of trade structure, given the current 1.25% target rate, you can go long a 98.75 call in the relevant month and short a 98.8125 call in the same month. Close as these two strike prices are, the premium collected on the short 98.8125 call should be only slightly less than that paid for the long 98.75 call. Because of that, this vertical call spread (or synthetic binary option) should cost very little.

The nature of a vertical call spread like this is that the short call truncates the potential reward at that strike price level. Exhibit 5 shows a typical vertical call spread expiration analysis.

#### Exhibit 5: Vertical Call Spread



This strategy limits losses to the premium paid and caps gains at the level of the short call strike price.

If you are long the vertical call spread and the Fed does ease 25 bps, your position will pay out the 6 1/4 bps between 98.75 and 98.8125, less the net premium paid. At \$10.4175 for a quarter basis point, this amounts to a gain of \$260 (again, less the net premium paid). If the Fed does nothing, this position will do nothing, but it will have cost very little. Because of the limited payout, this is a strategy to do in size, which the small cost makes all the more attractive. Depending on the strength of your opinion, you can consider wider strike price intervals. While going short, say, the 98.9375 call allows this strategy to participate in more of the price move, it also costs more. This is the trade-off that will, in part, govern your strike price choice.

## Conclusion

These informal examples of possible trading strategies using options on CBOT fed funds futures, along with the graphic comparison of the fed funds-Fed target rate with LIBOR-Fed target rate spreads, should make it clear that these options can help you do a more effective job of expressing your opinions concerning future Fed action. While these options will have volatility characteristics unlike those of the other frequently traded markets, and these differences must be factored into any trading strategy, these options nevertheless create interesting trading opportunities.

## For More Information

To learn more about options on CBOT fed funds futures and their unique characteristics, visit [www.cbote.com](http://www.cbote.com) or call 312-341-7995.