



## Advisory Notice

Clearing House

20 South Wacker Drive  
Chicago, IL 60606-7499  
www.cme.com

312/930.3170 *tel*  
312/930.3187 *fax*

06-154

TO: Clearing Member Firms  
Chief Financial Officers  
Back Office Managers

FROM: Clearing House Department

SUBJECT: **Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate**

DATE: June 19, 2006

**UPDATE #1:** At final settlement, options which are not in-the-money will have a normal final settlement price of 1 -- not a variable cabinet price of 1. Variable cabinet prices will never appear as settlement prices for these options, either at final settlement or previously.

The Chicago Board of Trade (CBOT) plans to launch trading **Binary Options on Target Fed Funds**. These contracts are expected to launch on July 12, 2006. These documents describe how these products will be handled in CME Clearing, and in particular how processing in the clearing system will allow firms to support these products with minimal modification to bookkeeping systems.

### The product -- Binary Option Calls and Puts

Binary Options on Target Fed Funds Rate are cash-settled calls and puts, where if at expiration the option settles in-the-money, the buyer of an option contract receives a set dollar amount -- exactly \$1,000. Similarly, if the option settles in-the-money, the seller of the option pays a set dollar amount -- exactly \$1,000.

Note that, unlike an ordinary cash-settled option, the amount of this cash flow is not proportional to the amount by which the option ends up in the money. As long as it settles in-the-money by at least one tick, and regardless of how much in-the-money it is, the long receives, and the short pays, the fixed amount. This is why it is called a binary option: there are exactly two possible outcomes, depending on whether the option expires in or out-of-the-money. Binary options are also sometimes called digital options.

CBOT Binary Options on Target Fed Funds Rate are standard CFTC-regulated products, and are subject to all normal customer-segregation requirements for CFTC-regulated products.

The clearing product code will be **08** (zero eight.) The CBOT ticker symbol will be **BUS**.

### Treatment as options on "book-instrument" futures

The CBOT Binary Options on Target Fed Funds Rate are not options on futures. Generically, they are (a) European-style cash-settled options on physicals, where the underlying physical is an index, and (b) with the characteristics of a binary (digital) option as opposed to standard vanilla options.

## Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate

Clearing House Advisory 06-154

June 19, 2006

Page 2 of 6

Since not all firm bookkeeping systems support binary options as a product type, these will be handled in the clearing system as **options on a cash-settled non-tradable underlying future**. The "synthetic underlying future" is designed to be a bookkeeping-system construct used to facilitate processing without significant systems modifications, and hence is called a "book-instrument future."

Once the options are defined in this manner, however, they trade normally, and prior to expiration, bookkeeping processing around trade and position processing occurs normally. In particular, when option trades occur, they are recorded on the trade register normally, and premium flows are calculated and banked exactly as they are for any normal option trade.

Because the options are defined as European-style options, no early exercise is possible.

### Price format information for the options and the synthetic underlying "future"

- ❖ Strike prices will be defined at 12.5 basis point increments -- for example, 95.000, 95.125, 95.250, 95.375, 95.500, etc.
  - Option strike prices will be provided in TREX messages and in the SPAN file with three implied decimal places (decimal locator of 3.)
  - For example, for an option strike price of 95.375, the TREX and SPAN format will be **0095375**.
- ❖ The minimum trade price fluctuation for the options will be defined as 1.00, *ie*, one probability point, worth \$10.00.
  - In other words, the contract value factor for the options is 10.
  - Option prices will be provided in TREX messages and in the SPAN file with two implied decimal places (decimal locator of 2.)
  - For example for an option price of 37.00, the TREX and SPAN format will be **0003700**.
- ❖ As with any CBOT option, variable cabinet trade prices will also be available. These will range from \$1 to \$9.
- ❖ At expiration, options will be assigned a final settlement price of either:
  - **100**, for options expiring at least one tick in-the-money, or
  - **1**, for options not so expiring.
- ❖ The non-tradeable underlying "future" will be defined with a minimum price fluctuation of 0.25, worth \$250:
  - In other words, the contract value factor will be 1,000.
  - Prices for this "future" will be provided in the SPAN file with four implied decimal places (decimal locator of 4.)
  - For example, for a final settlement price of 94.25, the SPAN format will be **0942500**.

### Special processing at expiration

On the expiration day, exercise and assignment processing proceeds normally, with one key exception:

First, determine whether the option is in-the-money by comparing the strike price of the option to the final settlement price of the "synthetic underlying future". Exactly as with a vanilla option, a call is in-the-money if the final settlement price of the synthetic future is greater than the strike price, and a put is in-the-money if the final settlement price of the synthetic future is less than the strike price. (Exact at-the-money options are deemed to be out-of-the-money.)

Out-of-the-money options simply expire worthless like any out-of-the-money option.

## Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate

Clearing House Advisory 06-154

June 19, 2006

Page 3 of 6

But for in-the-money options, transactions in the synthetic underlying future will be created as follows:

**For calls, transactions in the underlying "book-instrument" future are created at a price equal to one less than the final settlement price of that underlying "future."**

**For puts, transactions in the underlying "book-instrument" future are created at a price equal to one greater than the final settlement price of that underlying "future."**

Exactly as with vanilla options, an exercised long position in a call results in a buy of the underlying future, as does an assigned short position in a put. An exercised long position in a put results in a sell of the underlying future, as does an assigned short position in a call.

Again, the key difference to note is that the pricing of the resulting exercise transactions remains the same for puts and calls regardless of the ITM value of the option and is not priced based on the strike price of the option.

### Example of Results From Exercise Process

**"Synthetic Underlying Future" (SUF) Settlement Price = 95.00**

Exercised Calls	Strike	Exercised Puts	B/S	Exercised Futures Price	SUF Settlement Price	Resulting Collect
ITM	94.000	OTM	B	94.00	95.00	\$ 1,000
ITM	94.125	OTM	B	94.00	95.00	\$ 1,000
ITM	94.250	OTM	B	94.00	95.00	\$ 1,000
ITM	94.375	OTM	B	94.00	95.00	\$ 1,000
ITM	94.500	OTM	B	94.00	95.00	\$ 1,000
ITM	94.625	OTM	B	94.00	95.00	\$ 1,000
ITM	94.750	OTM	B	94.00	95.00	\$ 1,000
ITM	94.875	OTM	B	94.00	95.00	\$ 1,000
<b>At the Money</b>	<b>95.000</b>					
OTM	95.125	ITM	S	96.00	95.00	\$ 1,000
OTM	95.250	ITM	S	96.00	95.00	\$ 1,000
OTM	95.375	ITM	S	96.00	95.00	\$ 1,000
OTM	95.500	ITM	S	96.00	95.00	\$ 1,000
OTM	95.625	ITM	S	96.00	95.00	\$ 1,000
OTM	95.750	ITM	S	96.00	95.00	\$ 1,000
OTM	95.875	ITM	S	96.00	95.00	\$ 1,000
OTM	96.000	ITM	S	96.00	95.00	\$ 1,000

*OTM= Out of the Money*

*ITM= In the Money*

For example, suppose a firm's position in an expired in-the-money 94.75 call option is 35 long and 17 short, and a SUF settlement price at expiration is 95.00. The exercise and assignment process will create:

- A buy transaction for quantity of 35, at the price of 94.00
- A sell transaction for quantity of 17, at the price of 94.00

Transactions resulting from the exercise and assignment of Binary Options on Target Fed Funds Rate positions will be cash settled in the SUF contract at the expiration settlement price (95.00) and result in a collect of \$35,000 for exercised positions and a pay of \$17,000 for assigned positions.

## **Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate**

Clearing House Advisory 06-154

June 19, 2006

Page 4 of 6

Note also that on the expiration day, the final settlement prices for the options will be either 1, or 100. And because the options are analogous to a normal "cash-settled" futures options, there is no need to require all unaccepted giveups to be cleared up on the expiration day. Like any such option, firms will have several days following expiration to clear all transactions.

### **Performance bond processing**

No special processing will be required for calculation of performance bond requirements for these options. Data for them will be provided in the combined CBOT-CME SPAN® file exactly as for any normal option, including the normal 16 risk array values, the price, and the delta. CME Clearing will use special processing to determine risk array values appropriate to binary options, and these values will look somewhat unlike those for vanilla options. But neither special processing nor systems changes will be required by firms.

### **For more information**

Further information will be distributed shortly on testing schedules for firm. **Salient features of this contract are attached. If you have any questions please contact CME Clearing at 312-207-2525 or your CBOT Key Account Manager.**

## Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate

Clearing House Advisory 06-154

June 19, 2006

Page 5 of 6

### CBOT Binary Options on the Target Federal Funds Rate\*

#### Binary Options on the Target Federal Funds Rate\*

<b>Price Basis</b>	Par is on the basis of 100 points, with one point equal to \$10. Price is never less than zero points and is never greater than 100 points.
<b>Minimum Price Fluctuation</b>	One point, equal to \$10.
<b>Delivery Months</b>	<p>On any given date, options shall be listed for expiration in each of the next four (4) delivery months. An option's delivery month shall contain the terminal day of the regularly scheduled Federal Open Market Committee (FOMC) meeting that the option references. The FOMC meeting date that is fixed as the option expiration date shall be as shown in the FOMC meeting calendar at the time the option is listed for trading. The FOMC meeting calendar is maintained and published by the Board of Governors of the Federal Reserve at <a href="http://www.federalreserve.gov/fomc/#calendars">http://www.federalreserve.gov/fomc/#calendars</a></p> <p><i>Examples:</i> An FOMC meeting regularly scheduled for 10 November 2004 defines the Nov 04 option delivery month. An FOMC meeting regularly scheduled to begin on 31 January YY and to end on 1 February YY shall define the Feb YY option delivery month.</p>
<b>Last Trading Day</b>	<p>An option's last trading day shall be fixed when the option is listed for trading. The last trading day will be set as the date of the terminal day of the FOMC meeting that the option references, as shown in the FOMC meeting calendar at the time the option is listed for trading. An expiring option shall cease trading at 3 pm Eastern time (2 pm Chicago time) on its last trading day.</p> <p><i>Examples:</i> Nov 04 options shall be listed with a last trading day of 10 November 2004, corresponding to the FOMC meeting regularly scheduled for that date. Likewise, Feb YY options shall be listed so as to cease trading on 1 February YY, corresponding to the FOMC meeting regularly scheduled to begin on 31 January YY and to conclude on 1 February YY.</p>
<b>Trading Hours</b>	6 pm to 4 pm, Chicago time, Sun through Fri. Trading in an expiring option shall cease at 3 pm Eastern time (2 pm Chicago time) on the last trading day.
<b>Strike Levels</b>	<p>Option strikes shall bracket the prevailing target federal funds rate (expressed in 100-minus-rate terms). For newly-listed delivery months, strikes shall be listed in increments of 12.5 basis points, at the prevailing target plus twenty (20) consecutively higher and (20) consecutively lower strikes, subject to the constraint that strikes can never be less than 0.00 nor greater than 100.00.</p>

*Example:* On Tuesday, 21 September 2004, the FOMC sets the target federal funds rate at 1-3/4% (98.25 in 100-minus-rate terms). As of the following business day, the next four regularly scheduled FOMC meetings will conclude on 10 November 2004, 14 December 2004, 2 February 2005, and 3 May 2005. These dates define the Nov 04, Dec 04, Feb 05, and May 05 delivery months, respectively. Given this, all newly-listed options for May 05 delivery shall be at the following strikes: 98.25, the prevailing target federal funds rate; 14 striking prices, at 12.5 bp increments, from 98.375 up to 100.00, inclusive; and 20 striking prices, at 12.5 bp increments, from 98.125 down to 95.75, inclusive. (Note that, in this example, options expiring in Nov 04, Dec 04, and Feb 05 already would be listed for trading.)

## Clearing and Bookkeeping Processing for CBOT Binary Options on Target Fed Funds Rate

Clearing House Advisory 06-154

June 19, 2006

Page 6 of 6

### **Settlement**

An expiring option shall be cash settled with reference to the target federal funds rate (expressed in 100-minus-rate terms) that is in effect as of 6:00 pm Eastern time on the option's last trading day. Customarily (though not always) this will be the outcome of the regularly scheduled FOMC meeting that coincides with the option's last day of trading. The target federal funds rate shall be as found in the most recently published Statement of the FOMC, typically published immediately following adjournment of any FOMC meeting. (See <http://www.federalreserve.gov/fomc/#calendars>.)

For any Binary Put Option with a strike greater than the target federal funds rate (expressed in 100-minus-rate terms) on the option's last trading day, long position holders shall receive, and short position holders shall pay, \$1000. For any Binary Put Option with a strike equal to or less than the target federal funds rate on the option's last trading day, longs shall receive, and shorts shall pay, \$0.

For any Binary Call Option with a strike less than the target federal funds rate (expressed in 100-minus-rate terms) on the option's last trading day, long position holders shall receive, and short position holders shall pay, \$1000. For any Binary Call Option with a strike equal to or greater than the target federal funds rate on the option's last trading day, longs shall receive, and shorts shall pay, \$0.

*Example:* On Tuesday, 21 September 2004, the FOMC sets the target federal funds rate at 1-3/4% (98.25 in 100-minus-rate terms). For all Sep 04 Binary Call Options with strikes less than 98.25, long position holders shall receive, and short position holders shall pay, \$1000. For Sep 04 Binary Call Options with any other strikes, long position holders shall receive, and short position holders shall pay, \$0. All pays/collects entailed in final settlement shall take place after close of business on Tuesday, 21 September 2004.

### **Trading Platform**

Electronic only.

### **Matching Algorithm**

Pro-rata with preferencing and priority orders (min 25/max 250)

### **Ticker Symbol**

BUS (C for calls and P for puts).

\* Pending certification with the Commodity Futures Trading Commission.