Options on CME Bundle Futures

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David Reif
Interest Rate Business Line Management
312 648 3839
david.reif@cmegroup.com

Frederick Sturm
Research & Product Development
312 930 1282
frederick.sturm@cmegroup.com

This user's guide introduces the basics of options on CME Bundle futures.

- Section 1 spells out Bundle option contract terms and conditions.
- Section 2 reviews procedures for option exercise and assignment.
- Section 3 discusses how Bundle options augment the CME Eurodollar option suite.
- Section 4 details the flexibility of means available for hedging option delta exposures.
- Section 5 comments on the suitability of Bundle options for risk management of OTC swaption exposures.
- Section 6 sets out standards for block trading.
- Section 7 sketches the applicable CME Clearing and CME Globex fees.

(1) Options on Bundle Futures

Exhibit 1 summarizes Bundle option contract specifications. Each option is exercisable into a specified Two-Year, Three-Year, or Five-Year Bundle future (respectively, BU2, BU3, or BU5). In view of the Bundle futures contract's underlying notional exposure – quarterly floating-rate interest on a 2-year, 3-year, or 5-year interbank placement – *an option on a Bundle future is effectively the listed analogue to a conventional interest rate swaption*.

(1a) The Option's Underlying Instrument – CME Bundle Futures

Each option is exercisable into a CME Two-Year, Three-Year, or Five-Year Bundle futures contract for a specified futures delivery month. The Appendix summarizes Bundle futures contract specifications. (For a detailed discussion of the Bundle futures contract mechanism, please see Reif and Sturm, *CME Bundle Futures Reference Guide,* CME Group, May 2015.)

In a nutshell, the futures contract's unit of trade is:

- a notional 2-year (or 3-year, or 5-year) floating-rate Eurodollar interbank time deposit,
- with principal amount of approximately \$1,000,000,
- for spot (t+2) settlement on IMM Wednesday (the third Wednesday of the futures delivery month),
- paying 8 (or 12, or 20) consecutive quarterly installments of three-month Eurodollar interbank term interest thereafter,
- with floating rate resets on IMM Monday (the Monday before the third Wednesday) of each March, June, September, and December.

The interest rate exposure in this notional unit of trade takes form as a specified contract-grade bundle combination of CME Three-Month Eurodollar (ED) futures, comprising one each of ED futures for delivery in the nearest 8 (or 12, or 20) consecutive months in the March Quarterly cycle.

> *Example*: For BU2 futures for Sep 2015 delivery, the delivery standard is the 2-year bundle comprising one each of ED futures for all March Quarterly months from Sep 2015 through Jun 2017.

Prior to expiration and delivery, a Bundle futures contract exists as a single position line item. Upon expiration, for each open contract held long (short), CME Clearing assigns to the holder long (short) positions in one each of the ED futures in the contract-grade bundle.

Bundle futures prices are quoted and traded in the same 100-minus-rate terms as ED futures prices. Also like ED futures, each Bundle futures contract is sized in terms of its DV01 – the dollar value of 0.01 IMM Index points (or one basis point per annum, in terms of the contract interest rate). The DV01 of any Bundle future is scaled to the number of ED futures in its contract-grade bundle: Where the DV01 of an ED futures contract is \$25, the DV01 of a Two-Year Bundle future is \$200 (equal to 8 ED futures per 2-year bundle x \$25 per 01 per ED futures contract). Likewise, DV01s of Three-Year and Five-Year Bundle futures are $300 per contract and $500 per contract, respectively.

Exhibit 1 -- Specifications for CME Options on Bundle Futures

(All times of day referenced here and elsewhere in this publication are Chicago time, unless otherwise noted.)

Underlying Instrument

Each option is exercisable into one CME Bundle futures contract.

Product Codes

Options on…	*CME Globex and Clearing Product Code*
Two-Year Bundle Futures	BU2
Three-Year Bundle Futures	BU3
Five-Year Bundle Futures	BU5

Expiry Months

Quarterly Options: March Quarterly months (Mar, Jun, Sep, Dec)
Serial Options: Non-March Quarterly months (Jan, Feb, Apr, May, Jul, Aug, Oct, Nov)

Exercise Price Array

Integer multiples of 0.25 IMM Index points from 5.50 IMM Index points above to 5.50 IMM Index points below the current ATM exercise price, plus integer multiples of 0.125 IMM Index points from 1.50 IMM Index points above to 1.50 IMM Index points below the current ATM exercise price. *At-the-money (ATM) exercise price* is the option exercise price closest to the previous daily settlement price of the corresponding underlying Bundle futures contract.

Minimum Option Premium Increment

0.0025 IMM Index points.

Options on…	*0.0025 IMM Index Points ($ per contract)*
BU2	50
BU3	75
BU5	125

Termination of Trading

Last Day of Trading is Fri preceding 3rd Wed of Option Expiry Month. Trading in expiring options terminates with close of trading – typically 4pm -- on Last Day of Trading.

Option Exercise

American Style. Option may be exercised by buyer on any day that option is traded. Option buyer's clearing member firm must notify CME Clearing of intention to exercise no later than 7pm on day of exercise. Amy option contract remaining open as of its Termination of Trading shall expire at 7pm on Last Day of Trading. In the absence of contrary instruction, any expiring option that is in-the-money shall be automatically exercised.

Position Accountability and Reportability

Options on…	*Position Accountability (Futures-Equivalent Contracts)*	*Position Reportability (Futures-Equivalent Contracts)*
BU2	1,250+	25+
BU3	800+	25+
BU5	500+	25+

Block Trade Thresholds

Options on…	*RTH: 7am to 4pm (Contracts)*	*ETH: 12am to 7am (Contracts)*	*ATH: 4pm to 12am (Contracts)*
BU2	1,250+	625+	325+
BU3	825+	400+	200+
BU5	500+	250+	125+

Each block trade must be reported to the Exchange by the seller within 5 minutes of transaction during RTH, and within 15 minutes of transaction during ETH or ATH.

Trading Hours and Venue

CME Globex: 5pm to 4pm, Sun-Fri.
Globex Trade Match Algorithm: Eurodollar Option (Y Algorithm).

Option contracts described herein trade on and according to the rules of Chicago Mercantile Exchange.

Source: CME Group.

(1b) Option Expiry Months

For any Bundle futures product, the exchange currently lists Quarterly options expiring in each of the two nearest March Quarterly months.[1] A Quarterly option expiring in a given month is exercisable into a Bundle futures contract for delivery in the same month. (Eg, a September option is exercisable into a Bundle future for September delivery.)

The exchange also currently lists Serial options expiring in each of the two nearest non-March Quarterly months. A Serial option is exercisable into a Bundle future for delivery in the March Quarterly month next following the option expiry month. (Eg, Serial options expiring in July or August are exercisable into Bundle futures for September delivery.)

(1c) Minimum Increments in Option Premium

Similar to the relationship between ED futures and options on ED futures, the price of any Bundle option is quoted and traded in terms of the same IMM Index that gauges the price of the option's underlying Bundle future. Option premium trades in minimum increments of 0.0025 IMM Index points (or ¼ of one basis point per annum in futures contract interest rate terms).

(1d) Termination of Trading

Apart from exceptions (typically holiday-related), an expiring option ceases trading on the Friday before the third Wednesday (IMM Wednesday) of its expiry month, at the close of that day's trading session.

(2) Exercise and Assignment

A Bundle option may be exercised by the buyer on any CME business day on which the option is traded. For exercise to occur on any day before the option's termination of trading, the clearing member representing the option buyer must give notice of exercise to CME Clearing no later than 7:00 pm.

Following termination of trading in an expiring option series – and in the absence of timely contrary instruction – CME Clearing automatically exercises all remaining open positions in any option contract that is (strictly) in-the-money,[2] and automatically abandons open positions in any option contract that is either at-the-money or (strictly) out-of-the-money.

Contrary instruction allows an option buyer the right to abandon an option that expires in-the-money, instead of exercising it. Contrary instruction also permits an option buyer to proceed with exercise of an option that is either at-the-money or out-of-the money at termination of trading, instead of letting the option expire worthless. In either case, *contrary instruction must be delivered to CME Clearing by the clearing member representing the option buyer no later than 7:00 pm on the option's last day of trading.*[3]

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[1] The exchange may list options for expiry on any dates, for exercise into any Bundle futures contracts, as it may determine in its sole discretion. In practice, the exchange consults with market participants when establishing or altering the calendar of option listings.

[2] A call option is in the money if, on its last day of trading, the daily settlement price of its underlying Bundle futures contract lies strictly above the option's exercise price. The call option is out of the money if the corresponding futures daily settlement price is at or below the option exercise price. Conversely, a put option is in the money if, on its last day of trading, its underlying Bundle futures contract's daily settlement price lies strictly below the option exercise price, and is out of the money if the futures daily settlement price is at or above the option exercise price.

[3] For more information, please visit ***Contrary Option Exercise Instructions*** at http://www.cmegroup.com/clearing/contrary-option-exercise-instructions.html

Thereafter, CME Clearing randomly matches each open contract held long for exercise to an open contract held short.[4]

(2a) Exercise and Assignment Schedule for Quarterly Options

To summarize, for a Quarterly option expiring in-the-money the timetable typically runs as follows:[5]

> <u>2:00 pm, Fri before IMM Wed of expiry month</u>
> The exchange determines the daily settlement price for the Bundle future underlying the expiring Quarterly option. This, in turn, determines if the option expires in-the-money or out-of-the-money.
>
> <u>4:00 pm, Fri before IMM Wed</u>
> Trading in the option terminates.
>
> <u>7:00 pm, Fri before IMM Wed</u>
> In the absence of timely contrary instruction from the clearing firm representing the option buyer, CME Clearing assigns one underlying Bundle future at the option exercise price (eg, short (long) one underlying Bundle future to the long (short) holder of one expired in-the-money put option).
>
> <u>5:00 pm, Sun before IMM Wed</u>
> The Globex trading session for the ensuing Monday begins. Both the buyers of the just-expired option who have exercised, and the sellers of the just-expired option who have been assigned to take exercise, find themselves holding the resultant positions in the underlying Bundle futures.
>
> <u>2:00 pm, Mon before IMM Wed</u>
> IMM Monday is the last day of trading in Bundle futures positions assigned through exercise of the just-expired Quarterly option. Any option buyer who exercised, or option seller who was exercised to, may liquidate the resultant Bundle futures position between 5:00 pm Sunday and 2:00 pm on Monday, at which time the Bundle future ceases trading.

For any user not wanting to make or take delivery on expiring Bundle futures assigned through Quarterly option exercises, the implications are clear: *Either the Bundle futures exposure must be liquidated during the IMM Monday trading session (ie, between 5:00 pm Sunday and 2:00 pm Monday), or the predecessor Bundle option exposure must be liquidated prior to its expiration and assignment.*

(2b) Exercise and Assignment Schedule for Serial Options

For a Serial option expiring in-the-money the timetable is similar, but with less deadline pressure.

> Checkpoints at 2:00 pm, 4:00 pm, and 7:00 pm on Friday before IMM Wednesday of the Serial option expiration month are identical to the corresponding checkpoints for Quarterly options.
>
> <u>5:00 pm, Sun before IMM Wed</u>
> When the Monday Globex trading session opens on Sunday evening, both the buyer of a just-expired option who exercised and the seller of a just-expired option who was assigned to take exercise hold positions in the underlying Bundle futures. The Bundle futures so assigned are tradable for another one or two months before they expire and go to delivery. (Eg, September Bundle futures contracts assigned in exercise of July options remain tradable until IMM Monday of the ensuing September.)

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[4] For more detail, please see ***Options on Futures: The Exercise and Assignment Process*** at http://www.cmegroup.com/clearing/files/IR-284_OptionsExercise.pdf

[5] As before, the timetable is "typical" apart from holiday-related exceptions. And as noted above in Exhibit 1, all times of day referenced here are Chicago time, unless otherwise noted.

(3) What Do Bundle Options Add to the ED Option Toolkit?

The CME ED option complex equips market practitioners with an extensive financial toolkit, including a wide array of combinations of option terms-to-expiry versus terms-to-delivery in the underlying ED futures. Options on Bundle futures make a significant addition. Exhibit 2 schematizes how they mesh with ED options. For simplicity, it depicts listings in mid-May 2015 of Five-Year Bundle options expiring in June 2015 and September 2015 (BU5M5 and BU5U5, respectively).

> Columns, labelled across the top, indicate option expiration months in pairs. In each pair, the standard ED Quarterly option and the five coterminous ED Mid-Curve options appear in the left column, and the BU5 Quarterly option appears in the right column.
>
> Rows, labeled at left, denote (a) for any ED option the delivery month of the underlying ED future, and (b) for any BU5 option the delivery months of the ED futures that form the contract-grade bundle for the option's underlying BU5 futures contract.

Exhibit 2 – Eurodollar Options and Bundle Options: Which Option Exercises into Which Futures Contract?
(Partial listing of ED options and BU options, mid-May 2015)

Option Expiry Month:		Jun-15	Jun-15		Sep-15	Sep-15
Underlying ED or BU Futures:						
Jun-15		EDM5	BU5M5			
Sep-15					EDU5	BU5U5
Dec-15						
Mar-16						
Jun-16		E0M5				
Sep-16					E0U5	
Dec-16						
Mar-17						
Jun-17		E2M5				
Sep-17					E2U5	
Dec-17						
Mar-18						
Jun-18		E3M5				
Sep-18					E3U5	
Dec-18						
Mar-19						
Jun-19		E4M5				
Sep-19					E4U5	
Dec-19						
Mar-20						
Jun-20		E5M5				
Sep-20					E5U5	
Dec-20						
Mar-21						

Source: CME Group. For current listings of CME ED options and Bundle options, please visit, eg, http://www.cmegroup.com/trading/interest-rates/stir/eurodollar_quotes_globex_options.html and http://www.cmegroup.com/trading/interest-rates/stir/5-year-eurodollar-bundle_quotes_globex_options.html

Underlying futures for the two ED Quarterly options are marked by their respective product and delivery month codes – EDM5 and EDU5.[6] For ED Mid-Curve options, the underlying future is denoted similarly, but is prefaced by EO for 1-Year Mid-Curve options, E2 for 2-Year Mid-Curves, E3 for 3-Year Mid-Curves, E4 for 4-Year Mid-Curves, and E5 for 5-Year Mid-Curves.

To appreciate how they interact, consider an at-the-money Quarterly call option on BU5U5. The option is exercisable into a Bundle future which embeds the interest rate exposure of a strip of 20 ED futures spanning consecutive Quarterly delivery months from Sep 2015 to Jun 2020.

In an imaginary world with complete monthly listings of ED Mid-Curve options, a market participant could replicate the call option on BU5U5 by purchasing one at-the-money ED Quarterly call option and one each of 19 at-the-money ED Mid-Curve call options, all expiring in Sep 2015. As the right-hand column of Exhibit 2 suggests, this option portfolio, if exercised upon expiry, would result in a long position of 20 ED futures for delivery in each of the 20 Quarterly months from Sep 2015 through Jun 2020 -- identical to the outcome that eventually obtains if the call option on BU5U5 is exercised and the resultant Five-Year Bundle future is taken to delivery

In reality, this replication is infeasible. The exchange lists four of the requisite 19 ED Mid-Curve options (those that expire in Sep 2015 and that exercise into ED futures for delivery in Sep 2016, Sep 2017, Sep 2018, and Sep 2019, denoted in Exhibit 2 by E0U5, E2U5, E3U5, and E4U5, respectively). For a market participant willing to model the ED option volatility surface, the best alternative is apt to be a combination selected from the term structure of the six ED Quarterly and Mid-Curve options expiring in Sep 2015 (EDU5, EOU5, E2U5, E3U5, E4U5, and E5U5).

Against this backdrop, three virtues of the Bundle option come to the fore:

(a) *Exactitude*. Because the Bundle option is a precisely defined option on a precisely defined ED bundle exposure, it renders approximation unnecessary.

(b) *Convenience*. Because the Bundle option implicitly embeds within a single contract multiple ED Mid-Curve option exposures – a few of which are separately tradable, and several of which are not tradable at all. Thus, it permits the user to manage one accounting line item in place of many.

(c) *Opportunity*. Given the exchange's current option listings, there are practical limits to one's ability to assemble combinations of ED Mid-Curve options to approximate the properties of a Bundle option. Though synthetic approximation may not be exact, it might come close enough to be manageable. If so, then options on Bundle futures become a new and potentially attractive means for trading relative value relationships in the term structure of volatility across ED futures.

[6] For those unfamiliar with futures industry conventions for abbreviating month-year combinations, or for those wanting a memory refresher, each month is represented alphabetically:

F = January	G = February	H = March	J = April	K = May	M = June
N = July	Q = August	U = September	V = October	X = November	Z = December

Where there is no ambiguity, the year is represented by its final digit. Thus, October 2018 becomes V8, November 2021 becomes X1, September 2022 becomes U2, and so on.

(4) Hedging Delta Exposures in Bundle Options

Uniquely, options on Bundle futures allow users two means of laying off directional price exposure. *The user may delta-hedge with either (1) the option's underlying Bundle futures contract or (2) the corresponding contract-grade bundle of ED futures. Each hedge strategy is equivalent to the other in terms of initial margin requirements, exchange fees, and hedge effectiveness.*

Consider an example. Suppose it is mid-May 2015. You buy 200 at-the-money put options on Two-Year Bundle futures for June 2015 delivery (BU2M5). To neutralize directional exposure in your option position, you delta-hedge by buying either 100 BU2M5 futures or 100 June 2015 2-year ED bundles. Assume you post initial margins at levels applicable to hedge or member accounts.[7]

(4a) Initial margin requirements

Given CME Clearing's margin settings at the time, your initial margin postings are $372,500 on your delta-hedge position, irrespective of the strategy you choose. As Exhibit 3 demonstrates, with the 2-year ED bundle you post performance bond of $250 per contract on 100 Jun15 ED, plus $425 per contract on 100 each of Sep15, Dec15, and Mar16 ED, plus $550 per contract on 100 each of Jun16, Sep16, Dec16, and Mar17 ED, making a total of $372,500. You get precisely the same result if you post the requisite initial margin of $3,725 per contract on 100 BU2.

Exhibit 3 –
Delta Hedging 200 At-the-Money Bundle Options:
Initial Margin Requirements for 100 BU2 vs 100 2-Year ED Bundles, Mid-May 2015

BU2M5	*Jun15 2-Year ED Bundle*	=	*EDM5*	+	*EDU5, EDZ5, and EDH6*	+	*EDM6, EDU6, EDZ6, and EDH7*
$372,500 = 100 contracts x $3,725/contract	$372,500		100 contracts x $250/contract		300 contracts x $425/contract		400 contracts x $550/contract

Source: CME Group. For up-to-date information about margin levels, including margin credits applicable to intra-market and inter-market spreads and combinations, please visit http://www.cmegroup.com/clearing/risk-management/

(4b) Exchange and clearing fees

…are likewise identical. To see this, suppose you are a Customer of a Member Firm subject to Non-Member fees, and that you delta-hedge your Bundle option exposure by buying 100 2-year ED bundles. The Exchange currently allows Non-Members to pay a reduced CME Globex fee of $0.10 per contract for any ED future traded outright via a bundle combination. Added to the Clearing fee of $0.64 per contract, this makes an all-in fee of $0.74 per ED contract traded via a bundle. Accordingly, the exchange fee cost of your delta-hedge position is $592 (equal to ($0.74 per ED contract) x (800 ED contracts)).

If instead you delta-hedge by buying 100 BU2M5, the exchange fee charge remains $592 (equal to ($5.92 per BU2 future) x (100 BU2 contracts)). In either case, the all-in cost of exchange fees is minuscule, less than 3/100^{ths} of the DV01 of the hedge position.

Similarly, if you pay fees applicable to Rule 106.J. Equity Member Firms, then regardless of the delta-hedge strategy you employ the exchange fee cost is $152. That is equal to (19 cents per ED)

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[7] If instead you post initial margin at the speculator or non-member account level, then all requisite amounts will be 110 percent of the margin requirements for a hedge or member account. In this example, the total initial margin posting would be $409,750 instead of $372,500.

x (800 ED), and it is equal as well to ($1.52 per BU2) x (100 BU2)). In either case, the exchange fees amount to ¾ of one percent of the DV01 of the hedge position.

(4c) Daily settlement prices

…are set through a process that forces the mark-to-market on any Bundle future to be nearly identical to the combined marks-to-market on the corresponding contract-grade bundle of ED futures. On any given day, the Bundle future settlement price is the arithmetic average of that day's settlement prices of the ED futures in the contract-grade bundle. The arithmetic average value is rounded to four decimal places (the nearest 0.0001 IMM Index points), with tie values (unrounded average values ending in 0.00005) rounded down.

This mechanism bears two consequences. First, it means daily marks-to-market may differ as between the Bundle future delta-hedge and the ED bundle delta-hedge. Second, happily, the arithmetic of the rounding process ensures that *the maximum absolute size of any such gap between marks-to-market is small: no more than $1.00 per contract for BU2, no more than $1.50 per contract for BU3, and no more than $2.50 per contract for BU5.* In terms of the Bundle futures contract DV01, the difference is never more than ½ of one percent of a basis point.

In the example at hand, the differential between BU2M5's settlement price and the average of ED settlement prices in the June 2015 2-year ED bundle is never worth more than $1 per BU2M5 contract (ie, no more than $100 either way for the entire delta-hedge position).

As the data in Exhibit 4 suggest, moreover, the differential is typically less. During the middle two weeks of May 2015 the absolute magnitude of differences between daily marks-to-market on the two delta-hedge strategies varied between zero and 44/100ths of one percent of the hedge position's DV01 (ie, between zero on 8 May and 11 May and $88 on 19 May).

The saw-tooth pattern in the time series of mark-to-market differentials – negative one day, positive the next -- attests to another feature of the Bundle futures settlement price mechanism that makes it safe for you to choose one delta-hedge strategy or the other. Differentials between marks-to-market cannot persist, or cumulate in any lopsided way, over long intervals. For the two-week holding period shown in Exhibit 4, the *cumulative* differential between the Bundle futures delta-hedge versus the 2-year ED bundle delta-hedge is $75 (3/8 of one percent of the hedge position DV01) -- the same order of magnitude as the likely differential on any single day.

Exhibit 4 –
Daily Marks-to-Market: Long 100 June 2015 Bundle Futures (BU2M5) vs Long 100 June 2015 2-Year ED Bundles, 6-20 May 2015

(Assume futures positions are entered at daily settlement price levels on 6 May.
$ of variation margin received or paid (-))

	BU2M5 minus Jun15 2-Year ED Bundle	*BU2M5*	*Jun15 2-Year ED Bundle*
7-May	50	1,300	1,250
8-May	0	60,000	60,000
11-May	0	-40,000	-40,000
12-May	-50	11,200	11,250
13-May	50	33,800	33,750
14-May	-25	40,600	40,625
15-May	50	13,800	13,750
18-May	-75	-33,200	-33,125
19-May	88	-29,600	-29,688
20-May	-13	20,300	20,313

Source: CME Group

(5) Bundle Options and Interest Rate Swaptions

The price dynamics of Bundle futures closely mimic the dynamics of par rates on comparable spot-starting plain-vanilla interest rate swaps. Exhibit 5 illustrates with correlations between daily changes in mid-market spot par swap rates and daily changes in nearby Bundle futures contract rates for mid-July 2011 through mid-July 2014. All correlation values lie between 98 and 99 (on a scale of -100 to +100). The close correlative relationship between their respective underlying interest rate exposures evidences that *Bundle options are a potentially handy tool for risk management of over-the-counter interest rate swaption holdings*.

Exhibit 5 --
Correlations of Daily Changes in Bundle Futures Contract Rates
vs Daily Changes in Over-the-Counter Par Swap Rates
(18 July 2011 to 18 July 2014)

Bundle Futures	***Correlation with OTC Par Swap Rates***
BU5	98.9
BU3	98.6
BU2	98.0

Data sources: Bloomberg, CME Group.

Notes: For each Bundle future tenor and corresponding OTC swap tenor, 100 x Pearson correlation of (a) daily changes in contract rates implied by estimates of historical daily settlement prices of nearby Bundle futures with (b) daily changes in mid-market par rates on plain-vanilla spot-starting USD interest rate swaps, as of 3pm New York time. We are obliged to Wilson Wu for ably performing the calculations.

(6) Block Trade Standards

Standards for privately negotiated block trades in Bundle futures are set at parity with the standards that apply to bundles of ED futures. The same parity principle extends to Bundle options.

The minimum size requirement for block trading in any option on a Bundle future is a 2.5x multiple of the minimum size requirement for the corresponding Bundle future. (Their relative proportions are identical to the proportionality between size requirements for block trades in options on ED futures versus size requirements for block trades in ED futures). See Exhibit 6.

Any block trade in Bundle futures or in options on Bundle futures must be reported to the Exchange by the seller within 5 minutes of transaction during Regular Trading Hours, and within 15 minutes of transaction during European Trading Hours (12am to 7am) or Asian Trading Hours (4pm to 12am).

Exhibit 6 –
Minimum Size Requirements for Block Trading in CME Bundle Futures and Companion Options

RTH: Regular Trading Hours (7am-4pm)
ETH: European Trading Hours (12am-7am)
ATH: Asian Trading Hours (4pm-12am)

CME Products	***Futures***	***Options***
…	…	…
Two-Year Bundle (RTH)	500	1,250
Two-Year Bundle (ETH)	250	625
Two-Year Bundle (ATH)	125	325
Three-Year Bundle (RTH)	330	825
Three-Year Bundle (ETH)	165	400
Three-Year Bundle (ATH)	80	200
Five-Year Bundle (RTH)	200	500
Five-Year Bundle (ETH)	100	250
Five-Year Bundle (ATH)	50	125
…	…	…

Source: CME Group

(7) CME Clearing and CME Globex Fees

CME Globex fees for options on Bundle futures, shown in the right-hand column of Exhibit 7, are identical to those for options on ED futures, eg, 15 cents per option traded for Individual Equity Members, 25 cents per option traded for Non-Member Customers of Member Firms.

Exhibit 7 -- Fees for Options on Bundle Futures ($ per side (both buy side and sell side) per contract)

	Clearing Fees for Options on…			*Globex*
CME Membership Type	***BU2***	***BU3***	***BU5***	***Fee***
Individual Equity Members / Clearing Members / Rule 106.I Members / Rule 106.J Equity Member Firms / Rule 106.S Member Approved Funds	0.75	1.10	1.75	0.15
Rule 106.D Lessees / Rule 106.F Employees	2.21 / 2.46	3.27 / 3.63	5.38 / 5.98	0.15
Rule 106.R Electronic Corporate Member – Holding Member	2.79	4.12	6.77	0.10
Rule 106.R Electronic Corporate Member – Volume Incentive Program	4.02	5.93	9.76	0.10
Rule 106.H Firms / Rule 106.N Firms	2.79 / 4.02	4.12 / 5.93	6.77 / 9.76	0.10
Asian Incentive Program (AIP) Participants	2.79	4.12	6.77	0.10
International Incentive Program (IIP) Participants and International Volume Incentive (IVIP) Program Participants	2.79	4.12	6.77	0.10
Latin American Bank Incentive Program (LABIP) Participants	2.79	4.12	6.77	0.10
Latin American Commercial Incentive Program (LACIP) Participants	5.25	7.75	12.75	0.25
Latin American Fund Manager Incentive Program (FMIP) Participants	2.79	4.12	6.77	0.41
eFX Bank Incentive Program (BIP) Participants	5.25	7.75	12.75	0.25
CBOE Members (reduced for S&P Index and E-mini/E-micro S&P only)	5.25	7.75	12.75	0.25
Customers of Member Firms (Non-Members)*	5.25	7.75	12.75	0.25

Source: CME Group

Clearing fees for Bundle options (displayed in the central columns of Exhibit 7) are at approximate parity with Clearing fees for ED options in the sense that *all are comparable in relation to the interest rate responsiveness of their respective underlying futures contracts*.

Exhibit 8 illustrates the point with Clearing fees for Individual Equity Members and for Customers of Member Firms (Non-Members). For any ED option or Bundle option, the Individual Equity Member fee is in the neighborhood of 3/8 of one percent of the DV01 of the option's underlying futures contract. Similarly, for both ED options and Bundle options the Clearing fee settings for Non-Member Customers of Member Firms reside uniformly around 2.57 percent of the underlying futures contract DV01.

Exhibit 8 -- Options on Bundle Futures and Options on ED Futures: Parity of Clearing Fees

Options on…	**$ Value of Futures 01**	**Member Fees**	**Member Fees**	**Non-Member Fees**	**Non-Member Fees**
		$ / Option	As Pct of Futures 01	$ / Option	As Pct of Futures 01
BU2	200	0.75	0.38	5.25	2.63
BU3	300	1.10	0.37	7.75	2.58
BU5	500	1.75	0.35	12.75	2.55
ED	25	0.09	0.36	0.64	2.56

Source: CME Group

Appendix – CME Bundle Futures Specifications

Trading Unit

One bundle of CME Three-Month Eurodollar (ED) futures, with Bundle Tenor that meets the Delivery Standard.

Bundle: One each of a sequence of four (4) or more ED futures with consecutive Delivery Months in the March Quarterly delivery cycle, spanning a given Bundle Tenor, for a given Bundle Month.

Bundle Month: For a given Bundle, the Delivery Month of the constituent ED contract nearest to delivery.

Bundle Tenor	*Number of constituent ED contracts with consecutive March Quarterly delivery months*
2-Year	8
3-Year	12
5-Year	20

Product Codes

Bundle Futures	*CME Globex and Clearing Product Code*
Two-Year	BU2
Three-Year	BU3
Five-Year	BU5

Delivery Months

March, June, September, December

Price Basis and Contract Size

Price is quoted in IMM Index points, as the arithmetic average of prices of ED futures comprised in the Delivery Standard bundle. *Example*: A Bundle futures price of 93.6700 points signifies an average ED contract interest rate of 6.33 percent per annum.

Bundle Futures	*0.01 IMM Index Points ($ per contract)*
Two-Year	200
Three-Year	300
Five-Year	500

Minimum Price Increment

Bundle Futures	*Outrights: 0.0025 IMM Index Points ($ per contract)*	*Calendar Spreads: 0.000625 IMM Index Points ($ per calendar spread)*
Two-Year	50	12.50
Three-Year	75	18.75
Five-Year	125	31.25

Daily Settlement Prices

Average of daily settlement prices of ED contracts in Delivery Standard bundle, rounded to fourth decimal place (0.0001), with tie values (unrounded values ending in 0.00005) rounded down.

Termination of Trading

Last Day of Trading is 2nd London bank business day before 3rd Wed of Delivery Month. Trading in expiring Bundle futures ceases at time of ED futures daily settlement – typically 2pm -- on Last Day of Trading.

Delivery Standard

One bundle of ED futures of specified Bundle Tenor (2-Year, 3-Year, or 5-Year) with Bundle Month identical to Bundle futures Delivery Month.

Delivery

CME Clearing assigns a long (short) position of one Delivery Standard bundle per expiring Bundle futures contract to holders of all long (short) positions remaining open following Termination of Trading.

Final Settlement Price = Average of settlement prices of Delivery Standard bundle's constituent ED contracts on Last Day of Trading in expiring Bundle futures contract, rounded to fourth decimal place (0.0001) with tie values (i.e., unrounded values ending in 0.00005) rounded down.

ED Price Assignments in Delivery

For delivery of a bundle comprising *n* ED contracts, CME Clearing assigns constituent ED contracts at invoice prices determined as follows:

(1) Each ED contract, excluding ED contract for nearest delivery month, is assigned at its respective daily settlement price.

(2) ED contract for nearest delivery month (i.e., for delivery in the Bundle Month) is assigned at invoice price equal to:

n x (Final Settlement Price of expiring Bundle futures) minus
(sum of invoice prices of n-1 most remote ED contracts determined in Step (1))

Position Accountability and Reportability	Bundle Futures	Position Accountability (Contracts)	Position Reportability (Contracts)
	Two-Year	1,250+	25+
	Three-Year	800+	25+
	Five-Year	500+	25+

Block Trade Thresholds	Bundle Futures	RTH: 7am to 4pm (Contracts)	ETH: 12am to 7am (Contracts)	ATH: 4pm to 12am (Contracts)
	Two-Year	500+	250+	125+
	Three-Year	330+	165+	80+
	Five-Year	200+	100+	50+

Each block trade must be reported to the Exchange by the seller within 5 minutes of transaction during RTH, and within 15 minutes of transaction during ETH or ATH.

Trading Hours and Venue

CME Globex: 5pm to 4pm, Sun-Fri.
Globex Trade Match Algorithm: FIFO with LMM (T Algorithm).

Futures contracts described herein trade on and according to the rules of Chicago Mercantile Exchange.

Source: CME Group

Disclaimer

The information within this presentation has been compiled by CME Group for general purposes only. CME Group assumes no responsibility for any errors or omissions. Additionally, all examples in this presentation are hypothetical situations, used for explanation purposes only, and should not be considered investment advice or the results of actual market experience.

Neither futures trading nor swaps trading are suitable for all investors, and each involves the risk of loss. Swaps trading should only be undertaken by investors who are ECPs within the meaning of section 1a(18) of the Commodity Exchange Act. Futures and swaps each are leveraged investments, and because only a percentage of a contract's value is required to trade, it is possible to lose more than the amount of money deposited for either a futures or swaps position. Therefore, traders should only use funds that they can afford to lose without affecting their lifestyles. And only a portion of those funds should be devoted to any one trade because they cannot expect to profit on every trade. All references to options refer to options on futures.

All matters pertaining to rules and specifications herein are made subject to and are superseded by official Exchange rules. Current rules should be consulted in all cases concerning contract specifications.