CBOE FUTURES EXCHANGE EXECUTE SUCCESS℠

Regulatory Circular RG15-006

Date: January 27, 2015

To: Trading Privilege Holders
From: CBOE Research and Product Development Department
CFE Business Development
RE: CBOE/CBOT 10 Year Treasury-Note Volatility Index Futures:
Updated Product Description, Settlement Methodology and Risk Disclosure

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On Thursday, November 13, 2014, CBOE Futures Exchange, LLC (CFE) launched trading in futures on the CBOE/CBOT 10-Year U.S. Treasury Note Volatility Index (tickers: VXTYN (index) and VXTY (futures)). Listed below are some salient features of VXTYN futures:

- The VXTYN Index is based on real-time mid-quotes of options on 10-Year Treasury Note futures listed by CME Group (CME) which trade on the Chicago Board of Trade (CBOT) (OZN options), and is designed to reflect investor's consensus view of the expected volatility of CBOT 10-Year Treasury Note futures (TY futures) over the next 30 calendar days.

- VXTYN futures settle on a monthly basis. The final settlement date for VXTYN futures is pegged to be 30 calendar days before the expiration of the constituent OZN options used to calculate the final settlement value for VXTYN futures.[1] Specifically, the final settlement date for VXTN futures will be on the Wednesday that is 30 days prior to the last Friday of the calendar month immediately following the month in which the VXTYN contract expires that precedes the last business day of that month by at least two business days.[2] For example, the JAN 15 VXTYN futures will expire on Wednesday, January 21, 2015, which is 30 calendar days before February 20, 2015, which is the date when the constituent MAR 15 OZN options expire.[3]

- If the Wednesday is a CBOT holiday or if the Friday described above is a CBOT holiday, then the final settlement date for VXTYN futures shall be the business day immediately preceding the Wednesday.

- The trading hours for VXTYN futures are from 7:00 a.m. to 3:15 p.m.,[4] except that on the final settlement date the trading hours for expiring VXTYN futures will terminate at 2:00 p.m. Non-expiring VXTYN futures will continue to trade until 3:15 p.m. on that date.

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[1] OZN options expire in the calendar month that precedes their designated contract month, e.g., February OZN options expire in January. As a result, a January VXTYN futures contract would be calculated using March OZN options and a February VXTYN futures contract would be calculated using April OZN options, et cetera.
[2] This is the convention by which the final settlement date for OZN options is determined.
[3] The last Friday in February 2015 falls on the 27th and has fewer than two business days until the last business day of the month. As a result, OZN options will expire on February 20, 2015. Also note (as described in the preceding footnote) that March OZN options expire in February.
[4] All times referenced in this circular are Chicago time.

- The final settlement value for VXTYN futures is a special quotation (SQ) of the VXTYN Index. The SQ is calculated using the same formula as the spot/cash VXTYN Index, except that (1) the inputs are indicative values of CBOT Daily Settlement Prices of OZN options, instead of real time mid-quotations of OZN options, and (2) a different criterion is applied to select the range of at- and out-of-the-money puts and calls included in the calculation.

- The range of OZN option strikes used in the calculation is truncated after the highest at- and out-of-the-money put strike and the lowest at- and out-of the-money call strike with an indicative daily settlement price of one "tick" (1/64th of a point or $15.625), provided that the indicative daily settlement prices of put series below the lowest strike put in the range and call series greater than the highest strike call series in the range are no greater than one tick. For example, if the daily indicative settlement prices of at- and out-of-the money OZN options are: 1, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1,1,1, the range of strikes would be truncated as 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1. If the daily indicative settlement prices of at- and out-of-the money OZN options are: 1, 1, 2, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1, 1, 2, 1, 1 the range of strikes would be truncated as 1, 2, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1, 1, 2, 1.

Summary Product Specifications:

CONTRACT NAME:	CBOE/CBOT 10-Year U.S. Treasury Note Volatility Index (VXTYN) futures
LISTING DATE:	November 13, 2014.
DESCRIPTION:	The VXTYN is based on real-time mid-quotes of options on 10-Year Treasury Note futures listed on the Chicago Board of Trade (CBOT) (Symbol: OZN options), and is designed to reflect investors' consensus view of the expected volatility of CBOT 10-Year Treasury Note futures over the next 30 calendar days. A mid-quote is the midpoint between the bid and offer for an option series.
CONTRACT SIZE:	The contract multiplier for the VXTYN futures contract is $1,000.
TRADING HOURS:	7:00 a.m. to 3:15 p.m., except that on the Final Settlement Date the trading hours for expiring VXTYN futures will terminate at 2:00 p.m. Non-expiring VXTYN futures will continue to trade until 3:15 p.m. on that date. The end of day submission cut-off time for all Orders, quotes, cancellations and Order modifications for VXTYN futures (other than for the expiring VXTYN future on its Final Settlement Date) is 3:14:59 p.m. Any Orders, quotes, cancellations or Order modifications submitted after the end of day submission cut-off time will be automatically rejected by the Exchange.
TRADING PLATFORM:	CBOE Command.
CONTRACT EXPIRATIONS:	The Exchange may list for trading up to twelve contract months for the VXTYN future contract.
TICKER SYMBOLS:	Futures: VXTY Cash: VXTYN
PRICING CONVENTIONS:	Both futures prices and cash index levels are stated in decimal format.

MINIMUM PRICE INTERVALS:	0.01 index point for single and multiple leg trades and net prices of spread trades, equal to $10.00 per contract.
DOLLAR VALUE PER TICK:	$10.00 per contract.
CROSSING TWO OR MORE ORIGINAL ORDERS:	The eligible size for an original Order that may be entered for a cross trade with one or more other original Orders pursuant to Rule 407 is one Contract. The Trading Privilege Holder or Authorized Trader, as applicable, must expose to the market for at least five seconds under Rule 407(a) at least one of the original Orders that it intends to cross.
PRE-EXECUTION DISCUSSIONS:	The Order Exposure Period under Policy and Procedure IV before an Order may be entered to take the other side of another Order with respect to which there has been pre-execution discussions is five seconds after the first Order was entered into the CBOE System.
EXCHANGE OF CONTRACT FOR RELATED POSITION TRANSACTIONS:	Exchange of Contract for Related Position (ECRP) transactions may be entered into with respect to VXTYN futures contracts. Any ECRP transaction must satisfy the requirements of CFE Rule 414. The minimum price increment for an ECRP transaction involving the VXTYN futures contract is 0.01 index points.
BLOCK TRADES:	Pursuant to Rule 415(a)(i), the minimum Block Trade quantity for the VXTYN futures contract is 100 contracts if there is only one leg involved in the trade. If the Block Trade is executed as a transaction with legs in multiple expirations and all legs of the Block Trade are exclusively for the purchase or exclusively for the sale of VXTYN futures contracts (a "strip"), the minimum Block Trade quantity for the strip is 150 contracts and each leg of the strip is required to have a minimum size of 50 contracts. If the Block Trade is executed as a spread order that is not a strip, one leg must meet the minimum Block Trade quantity for the VXTYN futures contract and the other leg(s) must have a contract size that is reasonably related to the leg meeting the minimum Block Trade quantity. The minimum price increment for a Block Trade in the VXTYN futures contract is 0.01 index points.
NO BUST RANGE:	Pursuant to Rule 416, the CFE error trade policy may only be invoked for a trade price that is greater than 10% on either side of the market price of the applicable VXTYN futures contract. In accordance with Policy and Procedure III, the Help Desk will determine what the true market price for the relevant Contract was immediately before the potential error trade occurred. In making that determination, the Help Desk may consider all relevant factors, including the last trade price for such Contract, a better bid or offer price, a more recent price in a different expiration and the prices of related contracts trading on the Exchange and other markets.
TERMINATION OF TRADING:	The trading hours for expiring VXTYN futures contracts terminate at 2:00 p.m. on the Final Settlement Date.

	The expiring VXTYN future will be put in a closed state at 1:59:59 p.m. on its Final Settlement Date. As a result, no Orders, quotes, or Order modifications in the expiring VXTYN future will be accepted by the CBOE System at or after 1:59:59 p.m. on its Final Settlement Date. The CBOE System will complete the processing of any trades in the expiring VXTYN future on its Final Settlement Date that are matched by the CBOE System and that the CBOE System begins to process prior to 1:59:59 p.m. The CBOE System will not process any trades in the expiring VXTYN future on its Final Settlement Date that the CBOE System does not match and begin to process prior to 1:59:59 p.m.
FINAL SETTLEMENT DATE:	The Wednesday that is thirty days prior to the last Friday of the calendar month immediately following the month in which the VXTYN contract expires that precedes the last business day of that month by at least two business days ("Final Settlement Date"). If the Wednesday is a CBOT holiday or if the Friday described above is a CBOT holiday, then the Final Settlement Date shall be the business day immediately preceding the Wednesday.
FINAL SETTLEMENT VALUE:	The final settlement value for VXTYN futures (Ticker: VXTYS) shall be a Special Quotation (SQ) of VXTYN calculated using the indicative daily settlement prices published by CBOT, as further described below, for the OZN options used to calculate the final settlement value for expiring VXTYN futures on their Final Settlement Date. OZN options expire in the calendar month that precedes their designated contract month (e.g., February OZN options expire in January). For example, a January VXTYN futures contract would be calculated using March OZN options and a February VXTYN futures contract would be calculated using April OZN options. CBOT publishes indicative daily settlement prices for OZN options at approximately 2:00 p.m. (IDS Prices) and may subsequently update the IDS Prices after 2:00 p.m. The prices for OZN options that will be used to calculate the final settlement value for expiring VXTYN futures will be the most current IDS Prices received by Chicago Board Options Exchange, Incorporated (CBOE) at the time when CBOE commences the final settlement value calculation process at approximately 3:45 p.m. CBOE could determine to commence this process earlier or as late as 4:20 p.m. These prices are the final and only prices that CBOE will use to calculate the final settlement value for expiring VXTYN futures. The final settlement value used to settle expiring VXTYN futures will not be adjusted in the event that CBOT updates the IDS Prices for OZN options after CBOE commences the final settlement value calculation process.

	The OZN option series used to calculate the final settlement value for expiring VXTYN futures shall include: (i) all at- and out-of-the-money put options beginning with the highest-strike put option with an IDS Price equal to or greater than the minimum tick size for OZN options (1/64th of a point or $15.625) of one (1) tick and ending with the put option with a strike price equal to at-the-money strike K0; and (ii) all at- and out-of-the-money call options beginning with the call option with a strike price equal to the at-the-money strike K0 and ending with the lowest-strike call option with an IDS Price equal to or greater than the minimum tick size for OZN options (1/64th of a point or $15.625); provided that the IDS Prices of put series below the lowest strike put and of call series greater than the highest strike call are no greater than one tick. For example, if the IDS Prices of at- and out-of-the-money OZN options are: 1, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1, 1, 1, the range of strikes would be truncated as 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1. If the daily indicative settlement prices of at- and out-of-the-money OZN options are: 1, 1, 2, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1, 1, 2, 1, 1 the range of strikes would be truncated as 1, 2, 1, 2, 3, 5, 8, 10, 7, 6, 3, 3, 1, 1, 2, 1. The final settlement value will be rounded to the nearest $0.01. If the final settlement value is not available or the normal settlement procedure cannot be utilized due to a trading disruption or other unusual circumstance, the final settlement value will be determined in accordance with the rules and bylaws of The Options Clearing Corporation.
DELIVERY:	Settlement of VXTYN futures contracts will result in the delivery of a cash settlement amount on the business day immediately following the Final Settlement Date. The cash settlement amount on the Final Settlement Date shall be the final mark to market amount against the final settlement price of the VXTYN futures contract multiplied by $1,000.00.
POSITION LIMITS:	A person: (i) may not own or control more than 5,000 contracts net long or net short in all VXTYN futures contract expirations combined; and (ii) may not own or control more than 5,000 contracts net long or net short in the expiring VXTYN futures contract held during the last 5 trading days for the expiring VXTYN futures contract. The foregoing position limit shall not apply to positions that are subject to a position limit exemption meeting the requirements of Commission Regulations and CFE Rules.
MINIMUM REPORTABLE LEVEL:	200 or more contracts.

Settlement Methodology for VXTYN Futures[5]

The final settlement value of VXTYN futures is a Special Quotation (SQ) of the VXTYN Index calculated by applying the VXTYN Index formula to indicative daily settlement prices published by CBOT for the OZN options (IDS Prices) that will be used to calculate the final settlement value. The IDS Prices are based on a snapshot of OZN option quotes taken at approximately 2:00 p.m. CBOT first publishes IDS Prices for OZN options shortly after 2:00 p.m. and updates these IDS Prices until approximately 6:00 p.m., when final IDS Prices are published.

For the purpose of calculating the final settlement value of VXTYN futures, CBOE will use the latest set of IDS Prices available, which is usually at approximately 3:45 p.m., at the time when CBOE commences the final settlement value calculation. These IDS Prices will typically be the IDS Prices published by CBOT at or after 3:30 p.m. The final settlement value used to settle VXTYN futures will not be adjusted in the event that CBOT updates the IDS Prices for OZN options after CBOE commences the final settlement value calculation process.

The procedure used to determine the SQ is as follows:

1. Around 3:45 p.m. on the final settlement date, CBOE records the most current available IDS Prices for the relevant OZN option contract month.
2. Selection of OZN options entering the calculation of SQ:
    a. Determine the strike K at which the minimum of the difference between call and put IDS prices with the same strike occurs.
    b. Calculate the forward price as = $F = e^{rT}(C - P) + K$
    c. The at-the-money strike of the strip of OZN options is the strike K_0 immediately below the forward price.
    d. Sort the put and call options by strike in ascending order, and eliminate puts with strikes greater than K_0 and calls with strikes smaller than K_0. Include both the put and the call with strike K_0. Merge the remaining puts and calls in ascending order by strike.
    e. Scanning down this sorted array, determine all OZN puts with an IDS Price of 1 tick (1/64th of a point or $15.6.25) and screen out all but the put with the maximum strike. Similarly determine all OZN calls with an IDS Price of 1 tick and screen out all but the call with the minimum strike. For example, in the following array, CBOE would only use the bracketed and bolded prices: 1, [**1, 2, 3, 4, 7, 5, 4 ,3 , 1],** 1, 1. to calculate the final settlement value.
3. Apply the VXTYN Index formula below to the remaining OZN options to calculate the SQ. The time to expiration is expressed in minutes and will usually cover the period from 2:00

[5] The final settlement value is calculated using the same methodology as the spot (cash) VXTYN Index, except that the inputs are the indicative daily settlement prices published by the CBOT for the OZN options used to calculate the final settlement value for expiring VXTYN futures on their final settlement date.

p.m. on the final settlement date of VXTYN futures to 4:00 p.m. on the expiration date of the OZN options included in the calculation.[6]

$$VXTYN = 100 * \sqrt{\frac{2e^{r\tau}}{\tau}\{\sum_i \frac{\Delta K^{put}{}_i * P_i^{put}}{(K_i^{put})^2} + \sum_j \frac{\Delta K^{call}{}_j * P_j^{call}}{(K_j^{call})^2}\} - \frac{1}{\tau}(\frac{F}{K_0} - 1)^2}$$

- K_i^{put} is the strike of the i^{th} put included, and similarly K_j^{call} is the strike of the j^{th} call. Only at- and out-of-the-money strikes are included. Strikes with 0 bids and strikes further out than any two strikes with two consecutive 0 bids are excluded ("0 Bid Rule[7]").
- $\Delta K^{put}{}_i$ and $\Delta K^{call}{}_j$ are the strike intervals, equal to half the distance between strikes adjacent to the i^{th} strike for the puts, and jth strike for the calls, with the exception of extreme strikes where the strike interval is the distance to the next included strike.
- P_i^{put} and P_j^{call} are the mid-quotes of the i^{th} put strike and j^{th} call strike.
- The price of the option with the K_0 strike price reflects the average of the midquote prices of both the call and put at that strike price. For all other strike prices, a single call or put is used.
- τ is the time to expiration, expressed as a fraction of a year (or 30/365 in the formula), and r is the 30-day rate of interest. F is the 30-day forward price, and K_0 is the first listed strike below the forward price.

The final settlement value is rounded to the nearest $0.01. If the final settlement value is not available or the normal settlement procedure cannot be utilized due to a trading disruption or other unusual circumstance, the final settlement value will be determined in accordance with the rules and bylaws of The Options Clearing Corporation.

Risks Inherent in Settlement Procedure

There is an inherent risk of a significant disparity between the final settlement value of an expiring VXTYN futures contract and the spot/cash VXTYN Index value calculated and published before and after 2:00 p.m. on the final settlement date.

The final settlement value for VXTYN futures is calculated from theoretical IDS Prices for OZN options as of 2:00 p.m. received by CBOE at the time when CBOE commences the final settlement value calculation process at approximately 3:45 p.m. In contrast, all other VXTYN Index values disseminated during the life of a VXTYN futures contract are calculated using real-time mid-quotes of each of the constituent OZN option series at a particular time.

[6] The "time to expiration" used to calculate the SQ shall account for the actual number of days and minutes until expiration for the constituent OZN option series. For example, if the final settlement were to occur on a Tuesday because CBOT is closed on a Wednesday due to a CBOT holiday, the amount of time until expiration for the constituent OZN option series used to calculate the final settlement value of a VXTYN futures contract would be increased to reflect the extra day of trading in the constituent option series.

[7] "Cabinet" bids are considered as "0" bids for the purpose of the "0 Bid Rule."

In addition, the criterion used to select the range of OZN option strikes that is used to calculate the final settlement value for VXTYN futures is different from the criterion used to calculate the spot/cash VXTYN Index value.

Because the final settlement value and the cash/spot VXTYN Index value use different inputs and there are different criteria for determining the range of strikes in the calculation, market participants should be aware that the possibility exists that there could be a significant difference between the final settlement value for a VXTYN Index futures contract and the cash/spot VXTYN Index value published throughout the day on the final settlement date. As described above, market participants should also be aware that the final settlement value used to settle VXTYN futures will not be adjusted in the event that CBOT updates the IDS Prices for OZN options after CBOE commences the final settlement value calculation process.

Additionally, because the final settlement value is calculated based on theoretical OZN options prices, it is not possible to trade OZN options at those prices. This means that market participants carrying a VXTYN futures position hedged by OZN options to settlement cannot expect to trade out of their OZN options at the prices that are used to calculate the final settlement value for VXTYN futures. As a result, there is no guaranteed convergence between the final settlement value of VXTYN futures and the 2:00 p.m. price of the portfolio of OZN options used to hedge VXTYN futures, and hedgers will necessarily be exposed to basis risk.

Additional Information

VXTYN Futures Micro Site:

- http://www.cboe.com/micro/volatility/VXTYN/default.aspx

Current CFE Margins (for all CFE products):

- http://cfe.cboe.com/margins/CurDoc/Default.aspx

For regulatory questions, please contact the Regulatory Interpretations and Guidance team at RegInterps@cboe.com or (312) 786-8141 for additional information. For product-related questions, please contact Bill Speth at spethw@cboe.com or (312) 786-7141 or Catherine Shalen at shalenc@cboe.com or (312) 786-7146 for additional information.

(Replaces CFE Regulatory Circular RG14-040)