



INTEREST RATE PRODUCTS

Synthetic Basis Trades with On-The-Run U.S. Treasury Futures

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INTRODUCTION

On-The-Run U.S. Treasury futures make it possible for fixed income investors to create synthetic basis trades by combining OTR Treasury futures with the benchmark Treasury futures contracts that track the cheapest-to-deliver Treasury securities.

The addition of three new On-The-Run (OTR) U.S. Treasury futures contracts provides market participants with direct, efficient and cost-effective exposure to yields on current (most recently auctioned) 2-year, 5-year and 10-year Treasury securities. OTR Treasury futures complement the CME Group popular suite of Treasury futures that track the cheapest-to-deliver (CTD) cash Treasury securities.

By combining OTR Treasury futures with CTD Treasury futures, traders can express market views or exploit relative value opportunities in the price differentials between on-the-run and CTD cash Treasury securities.

OTR-CTD Treasury Futures Spread Characteristics

As Exhibits 1 and 2 indicate, spreads between OTR Treasury futures and CTD Treasury futures — OTR-CTD spreads — are a potentially rich source of trading opportunities. For the interval January 2, 2009, to October 14, 2010, [Exhibit 1](#) tabulates high, median and low values of spreads between fair-value estimates of daily settlement prices of hypothetical* nearby OTR Treasury futures contracts and actual daily settlement prices of the corresponding nearby CTD Treasury Note futures. [Exhibit 2](#) depicts daily closing levels of these spreads and their daily changes. The salient conclusion is that OTR-CTD Treasury futures spreads exhibit both secular stability and ample short-term volatility.

EXHIBIT 1: OTR-CTD TREASURY FUTURES SPREADS: DISTRIBUTIONAL CHARACTERISTICS

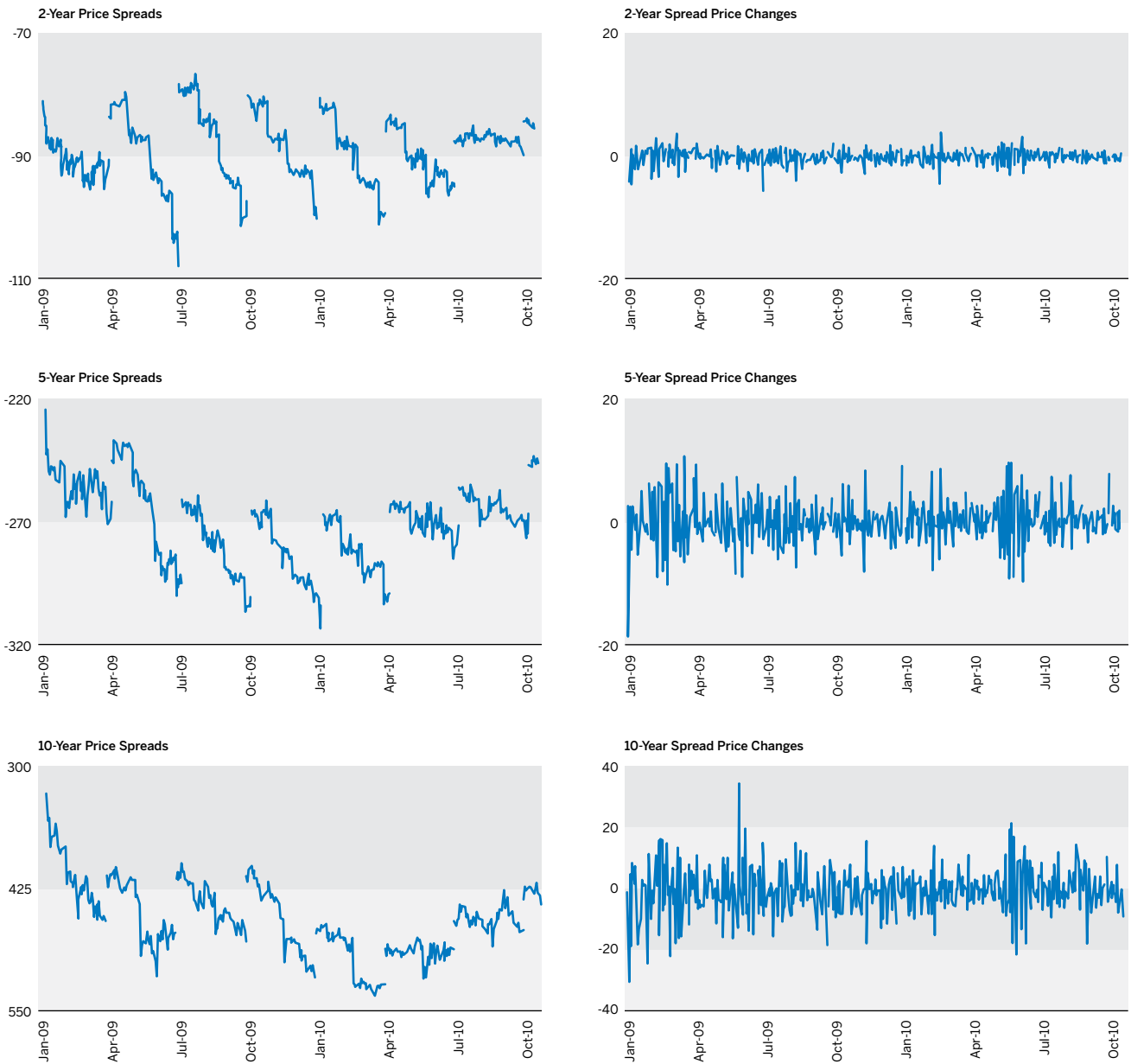
	2-Year	5-Year	10-Year
Maximum	-76 1/2	-224 3/4	-328
Median	-87 3/4	-269 1/4	-458
Minimum	-107 3/4	-313 3/4	-533 1/2
Range (= Max-Min)	31 1/4	89	205 1/2
Standard Deviation Of Daily Changes	1.1	3.6	7.4

Data Source: CME Group

* In this brochure, fair value estimates of the daily settlement prices of the hypothetical nearby OTR Treasury futures contracts are based on the forward yield of the forward price of the spot price of the current on-the-run Treasury security, financed at the general collateral term repo rate from the trade date through the futures contract expiration date using standard fixed income calculation methods.

EXHIBIT 2: HEDGING A LONG TREASURY POSITION WITH 10-YEAR T-NOTE FUTURES

(Hypothetical Nearby OTR Treasury Futures Daily Settlement Price minus Nearby CTD Treasury Futures Daily Settlement Price, 32nds of Price Points)



Data Source: CME Group

Structuring the Trade

To set up an OTR-CTD spread properly requires at least three considerations: whether to buy or sell the spread, how to weight its legs, and which contract delivery month to deploy on each leg.

Spread Conventions

In the cash market for Treasury notes, a spread between an on-the-run issue and a seasoned issue is quoted as a price differential relative to the on-the-run issue's price. This same convention applies to OTR-CTD Treasury futures spreads.

As [Exhibit 2](#) dramatizes, one consequence is that OTR-CTD spreads almost invariably will trade at negative levels. The reason is that OTR Treasury futures, which are based on a pricing system normalized around a 4 percent notional coupon, will naturally tend to trade at price levels that are lower than those for CTD Treasury futures, which rely on a system of delivery conversion factors that are normalized around a 6 percent notional coupon. (If instead the normalizing coupon for both contract families were the same, then the OTR-CTD spread would be more likely to trade either side of zero, rather than at negative levels.)

- **If you expect the spread to strengthen** (i.e., to become less negative) as a result of OTR Treasury futures outperforming CTD Treasury futures, then you would buy the OTR-CTD Treasury futures spread by buying OTR Treasury futures and selling CTD Treasury futures.
- **Conversely, if you expect the spread to weaken** (i.e., to become more negative) as a result of CTD Treasury futures outpacing OTR Treasury futures, then you would sell the OTR-CTD Treasury futures spread by selling OTR Treasury futures and buying CTD Treasury futures.

Contract Weighting^{1,2}

The OTR-CTD spread should be structured so that parallel changes in market yield levels generate no profit or loss. That is, the spread position should generate profit or loss only if the slope of the yield curve changes. For this purpose, the legs of the spread should be weighted so that the yield sensitivity of each leg is equal in size and opposite in sign to the yield sensitivity of the opposite leg.

The most common approach to obtaining the correct spread ratio is to use the ratio of the dollar value of a one basis point change in yield (the DV01) of one leg to the DV01 of the other leg. For OTR-CTD spreads, to get the number of CTD Treasury Note futures to spread against one OTR Treasury futures to achieve DV01-neutral spread exposure, simply divide the DV01 of the OTR Treasury futures by the DV01 of the CTD Treasury Note futures. For more information on OTR Treasury futures DV01s, please visit the CME Group Yield Center at www.cmegroup.com/yield.

Expiry Selection

For an OTR-CTD spread position to be manageable requires that the delivery months on each leg of the spread be paired correctly. OTR Treasury futures follow a contract expiry schedule that corresponds to the U.S. Treasury auction calendar, which differs from the schedule of delivery months for CTD Treasury futures.

10-Year OTR Treasury futures, for example, expire by cash settlement on 10-year Treasury note auction days in February, May, August and November, while CTD Treasury futures expire by physical delivery in March, June, September or December. Given this, 10-Year OTR-CTD spreads typically should pair 10-Year OTR Treasury futures for a given expiry month with CTD 10-Year Treasury Note futures for delivery in the following March-quarterly month. For instance, a May 10-Year OTR-CTD spread would pair May 10-Year OTR Treasury futures with June CTD 10-Year Treasury Note futures, while a November 10-Year OTR-CTD Treasury spread would pair November 10-Year OTR Treasury futures with December CTD 10-Year Treasury Note futures.

¹ DV01s for OTR Treasury futures can be found in the spreadsheet "OTR Treasury Futures Price-Yield-DV01-Convexity Tables," which is located on the CME Group website at www.cmegroup.com/otr under "Resources."

² To learn how to calculate the DV01s for Treasury futures, please refer to the document "Calculating the Dollar Value of a Basis Point," which can be found at www.cmegroup.com/interestrates in the "Tools and Analytics" section for Treasuries.

Because 2-year and 5-year Treasury notes are auctioned monthly, 2-Year and 5-Year OTR Treasury futures have monthly expiries. As a result, the 2- or 5-Year OTR Treasury futures should pair up with CTD Treasury futures for delivery in the following March-quarterly month. For example, a December or January or February 2-Year OTR-CTD spread would pair a December or January or February 2-Year OTR Treasury futures with a March CTD 2-Year Treasury note futures. However, a March or April or May 2-Year OTR-CTD spread would pair March or April or May 2-Year OTR Treasury futures with June CTD 2-Year Treasury Note futures.

Example:

It is June 15. Suppose you anticipate that the Federal Open Market Committee, at its June 22-23 meeting, will approve policy measures that are more aggressively stimulative than market participants generally expect. On this premise, you look for the Treasury yield curve to flatten around the 10-year maturity point, leading the nearby 10-year OTR-CTD spread to strengthen (i.e., to become less negative). Accordingly, you buy the August 10-Year OTR-CTD Treasury spread by buying August 10-Year OTR Treasury futures (TNQ0) and selling September CTD 10-Year Treasury Note futures (ZNU0).

Suppose TNQ0 is priced at 105-110 with a DV01 of \$86.93 per contract, while ZNU0 is priced at 120-230 with a DV01 of \$77.20 per contract. The price spread is -492/32nds (equal to 105-110 minus 120-230).

To keep the spread position DV01-neutral, the appropriate spread ratio is 1.126 ZNU0 for every TNQ0 (equal to \$86.93/\$77.20). That is, for every 1,000 TNQ0 you buy, you would sell 1,126 ZNU0. Alternatively, for every 1,000 ZNU0 you sell, you would buy 888 TNQ0.

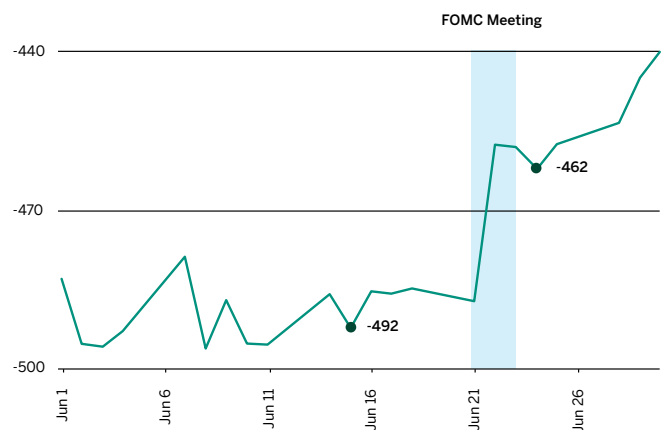
Trade Results

Now suppose you unwind the trade on June 24 by selling 1,000 TNQ0 and buying 1,126 ZNU0. Between June 15 and June 24 the 10-year sector of the Treasury yield curve has rallied, leading to price increases on both legs of the spread. Moreover, the on-the-run 10-year yield has fallen relatively more than yields on seasoned 10-year notes. Thus, while ZNU0 futures prices have risen by 20 32nds of a price point, TNQ0 prices have soared by 50 32nds, causing the August 10-Year OTR-CTD spread to strengthen — to become less negative — by 30 32nds. [Exhibit 3](#) illustrates.

As [Exhibit 4](#) summarizes, the 1,000-contract position in TNQ0 earns cumulative variation margin of \$1,562,500. Losses on the short position of 1,126 ZNU0 result in cumulative variation margin payments of \$703,750. Net profit on the spread is \$858,475.

EXHIBIT 3: AUG 2010 10-YEAR OTR-CTD SPREAD: DAILY CLOSING LEVELS, JUNE 2010

(Hypothetical Nearby OTR Treasury Futures Daily Settlement Price minus Nearby CTD Treasury Futures Daily Settlement Price, 32nds of Price Points)



Data Source: CME Group

CREATING A CAPITAL EFFICIENT TRADE

One of the most noteworthy benefits of the OTR-CTD spreads is the increased capital efficiency relative to trading a combination of securities and futures. The futures spread combination should result in significant performance bond offsets. For illustration, assume that initial margin for both 10-Year OTR Treasury futures and standard 10-Year Treasury Note futures is \$1,890 per contract and that a 1:1 contract spread is entitled to a margin credit of 65 percent. In the previous example, the spread trader would have posted initial performance bond of just \$1,561,140 — approximately $\frac{3}{4}$ of one percent of the \$212.6 million gross notional value of the spread position. The spread trader would have realized a return of 55 percent on the initial investment of the performance bond.

In contrast, spread traders who use cash bonds will not see the benefit of paying lower performance bonds or receiving spread credits against positions they already may have in other interest rate futures listed at CME Group exchanges. A spread trader establishing this position with Treasury securities and Treasury futures would have had a requirement of \$1,890,000 for the 1,000 CTD 10-Year Treasury Note futures, and may have been subject to a haircut for Treasury repo. In addition, market practitioners who create spread positions with cash Treasury securities must contend with vagaries of term repo financing as well as with the inherent risks of delivery failure in the financing markets.

For authoritative current information on CME Group margin requirements, please visit www.cmegroup.com/margins.

EXHIBIT 4: EXAMPLE: 10-YEAR OTR-CTD TREASURY FUTURES SPREAD PROFIT/LOSS

	June 15 Price	June 24 Price	Price Change (32nds)	Price Change (\$ per contract)	Number of Contracts Long (+) or Short (-)	Profit / Loss = Price Change x Quantity (\$)
Aug2010 10-Year OTR Treasury Futures	105-110	106-290	50	1,562.50	1,000	1,562,500
Sep2010 10-Year T-Note Futures	120-230	121-110	20	625.00	-1,126	-703,750
Spread (32nds)	-492	-462				
Net Profit/Loss						858,750

Impact of CTD Changes to the Spread

A critical distinction for the spread trader to bear in mind is that OTR Treasury futures expire by cash settlement, whereas CTD Treasury futures expire by physical delivery of cash securities.³ During the interval over which you hold the OTR-CTD spread, the general level of yields may change, or the slope of the yield curve may shift, across the term-to-maturity span of deliverable grade for CTD Treasury Note futures. This, in turn, may cause the identity of the cheapest-to-deliver note to change, thereby affecting the spread position's profitability.

³ For 2-Year Treasury Note futures, notes eligible for delivery have original maturity of no more than 5 years 3 months and remaining term to maturity between 1 year 9 months and 2 years. For 5-Year Treasury Note futures, deliverable-grade notes have original maturity of no more than 5 years 3 months and remaining term to maturity of at least 4 years 2 months. For 10-Year Treasury Note futures, deliverable-grade notes have remaining term to maturity of at least 6 years 6 months and no more than 10 years. The price of any one of these futures contracts tends to track the price of the deliverable-grade Treasury note that is expected to be the most economical, or cheapest, to deliver into the contract during its delivery month.

KEY BENEFITS OF OTR-CTD TREASURY FUTURES SPREADS

- **Transparency:** OTR-CTD spreads are transparently traded in a regulated market, and the futures contracts on each of the spread's legs are margined with reference to transparently determined daily marks-to-market.
- **Cost Efficiencies and Position Scalability:** The transactional costs of entering, liquidating or adjusting an OTR-CTD spread are apt to be low compared to a spread position consisting of cash Treasury securities.
- **Flexibility:** OTR-CTD spreads provide flexibility for investment managers who may be prohibited from making short sales of Treasury securities but are permitted to hold short open interest in exchange-listed futures.
- **Asset Preservation:** OTR-CTD spreads may assist the fund manager in adhering to a portfolio's core asset allocation strategy while achieving the desired adjustment to the portfolio's duration.
- **Anonymity and Global Access:** OTR-CTD spreads are available for electronic trading on CME Globex virtually 24 hours a day.
- **CME Clearing Guarantee:** Both OTR Treasury futures and CTD Treasury futures enjoy the full backing of CME Clearing and greatly benefit from margin efficiencies between long and short positions. Fixed income investors can pledge their existing Treasury or Agency securities as performance bonds.

Implied Intercommodity Spreads

OTR-CTD spreads are among the many Intercommodity Treasury spreads (ICS) listed on CME Globex. These pre-defined, implied spreads allow you to execute an OTR-CTD spread strategy as one trade, without legging risk. OTR-CTD spread ratios are pre-defined at values that are expected to remain stable absent substantial changes in the market prices. For more information, including current spread ratios, please visit www.cmegroup.com/ics.

To learn more about On-The-Run Treasury futures, please visit www.cmegroup.com/otr.



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References to CME Clearing are to CME's U.S. Clearinghouse.

OTR Treasury futures are listed with and subject to the rules and regulations of the CBOT.

Futures trading is not suitable for all investors, and involves the risk of loss. Futures are a leveraged investment, 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 a futures 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.

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