

# Implied U.S. Treasury Futures Spreads (ICS) on CME Globex An Overview

March 2012

# U.S. Treasury Futures Intercommodity Spreads (ICS) on CME Globex

- Implied, pre-defined spreads on U.S. Treasury and Interest Rate Swap futures, traded on CME Globex

•TYT: 2-Year T-Note vs. 3-Year T-Note	•FYT: 5-Year T-Note vs. 10-Year T-Note
•TUF: 2-Year T-Note vs. 5-Year T-Note	•FOB: 5-Year T-Note vs. T-Bond
•TUT: 2-Year T-Note vs. 10-Year T-Note	•NOB: 10-Year T-Note vs. T-Bond
•TUB: 2-Year T-Note vs. T-Bond	•FOS: 5-Year T-Note vs. 5-Year Swap
•TOF: 3-Year T-Note vs. 5-Year T-Note	•NOS: 10-Year T-Note vs. 7-Year Swap
•TUN: 3-Year T-Note vs. 10-Year T-Note	•TOS: 10-Year T-Note vs. 10-Year Swap
•TOB: 3-Year T-Note vs. T-Bond	•BOI: T-Bond vs. 30-Year Swap
•TUL: 2-Year T-Note vs. Ultra T-Bond	•TOU: 3-Year T-Note vs. Ultra T-Bond
•FOL: 5-Year T-Note vs. Ultra T-Bond	•NOL: 10-Year T-Note vs. Ultra T-Bond
•BOB: T-Bond vs. Ultra T-Bond	•UOS: Ultra T-Bond vs. 30-Year Swap

- Allow for easier, more efficient execution of Treasury and Swap spreads



# U.S. Treasury Futures ICS on CME Globex: Key Benefits

- **Eliminates price slippage**
  - Work spread orders during periods of high market volatility without price slippage
- **Increases matching opportunities by providing automated arbitrage between outright and spread order books**
  - Implied functionality enhances liquidity and creates efficient markets
- **Provides arbitrage opportunities**
  - Match engine may be able to “leg” spread orders at prices better than the spread order price
- **Defining the spreads builds benchmarks**

# U.S. Treasury Futures ICS on CME Globex: Description

- **Spreads trade in exchange-defined ratios**

- The front leg is the contract with the shorter maturity, except for the NOS (10-Year Notes over 7-Year Swap spread).

- **Components of the spread trade have the same expiration month and year**

Example:

June 2012 5-Year U.S. Treasury Note vs. June 2012 10-Year U.S. Treasury Note

Price Ratio = 1.5001

Quantity Ratio: 3:2

External name: FYT 03-02 M2

- **Minimum spread tick is equal to that of the minimum tick of the front leg of the spread.**

- **Spread quotes are based on:**

(Net change of front leg) - [(net change of second leg) / price ratio]

# U.S. Treasury Futures ICS on CME Globex: Description

- **Buying the spread refers to buying the front leg and selling the second leg**
- **Good Till Cancelled (GTC) and Good till Date (GTD) order qualifiers not supported**
- **Spread type: IV**
- **Implied outrights created by Intercommodity spreads have no FIFO priority**
- **Generally only 1<sup>st</sup> generation implied “in” market data is disseminated**
  - Implied “out” prices on inter commodity spread legs are not disseminated
  - EXCEPTION: Implied “out” market will be displayed for spreads with 1:1 quantity ratios

# U.S. Treasury Futures ICS on CME Globex: Trade Match Description

- **Incoming ICS orders match first with resting ICS orders at the same or better price**
  - In these cases, leg prices are allocated such that net change in the front leg matches the net change of the spread price. The price assigned to the back leg is the settlement price of the previous day (unchanged)
- **If there is no resting ICS spread order at the required price, CME Globex will then look to the constituent leg prices to see if there is a potential match**
- **In cases where CME Globex “legs” the order, the spread order will be executed at the most advantageous differential possible, which may be better than the price on the incoming order**
- **Significance: while ICS prices are disseminated and orders entered at “standard” (.25, .50, .75, 1.0) tick increments, ICS orders are frequently matched at bid/ask spreads narrower than “standard” tick increments**

# U.S. Treasury Futures ICS on CME Globex: Trade Match Example

The June FYT is currently listed at a 3:2 quantity ratio (and a corresponding 1.5001 price ratio)

- June 2012 5-Year T-Notes have a bid-ask spread of +1.25B/+1.5A
- June 2012 10-Year T-Notes have a bid-ask spread of +5.0B/+5.5A

o **FYT Bid price:**  $(+1.25) - (+5.5/1.5001) = -2.4164B$

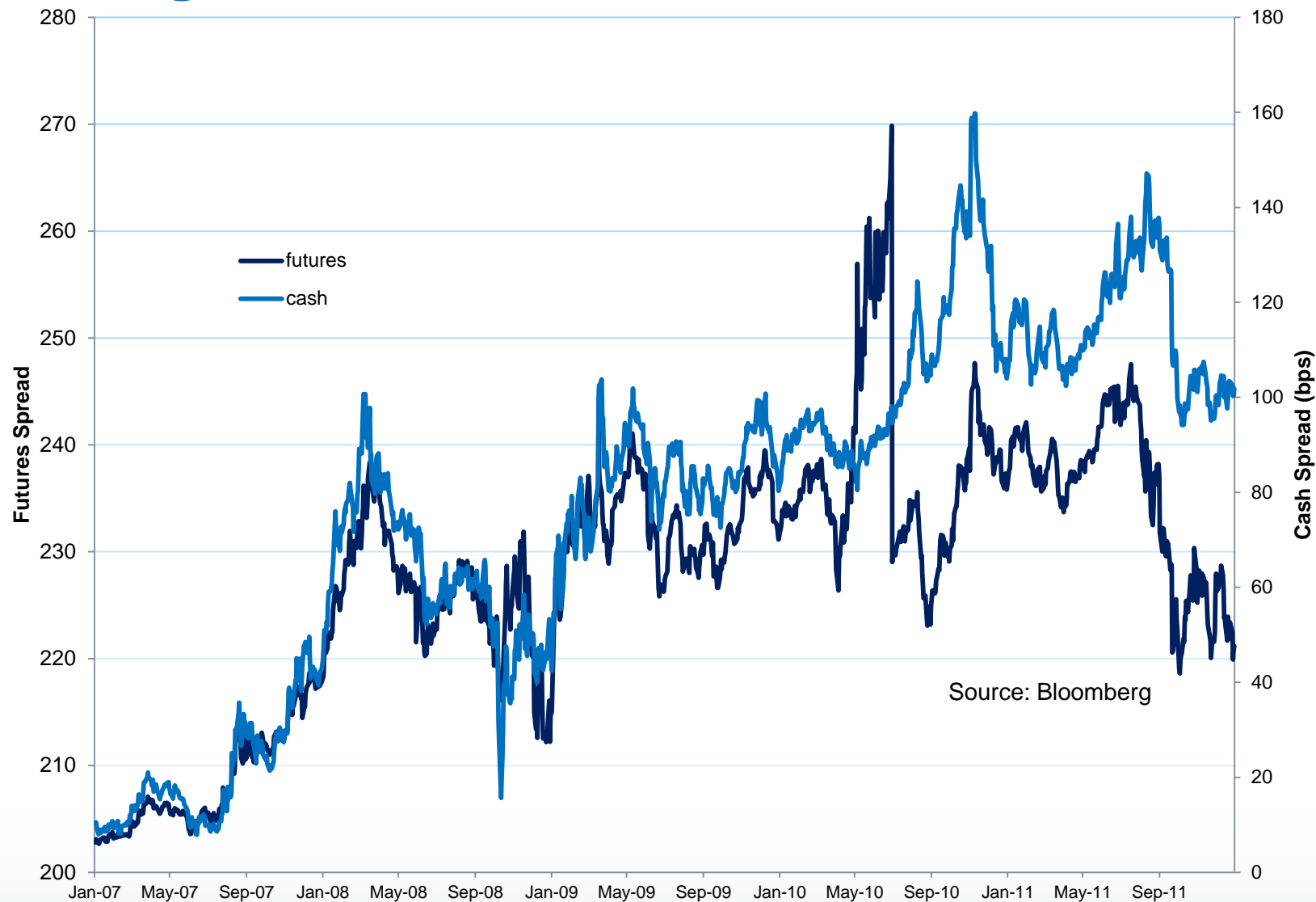
Disseminated as: -2.50 (-2.416 rounded down to the nearest .25/32nd increment)

o **FYT Ask price:**  $(+1.50) - (+5.0/1.5001) = -1.8331A$

Disseminated as: -1.75 (-1.8331 rounded up to the nearest .25/32nd increment)

***Absent resting spread bids at -2.5 or offers at -1.75, in this scenario an aggressor entering an order to sell the spread at -2.5 would actually be filled at -2.4164, while a buyer would pay -1.8331***

# Trading the NOB



- The daily futures chart above represents:  $5 \times (\text{TY Futures Price}) - 3 \times (\text{US Futures Price})$
- The daily cash chart shows the yield spread of on-the-run 30-year and 10-year

# Treasury Spread: Pricing Example

FYT 03-02 M2 (5-Year T-Note vs. 10-Year T-Note)

- Quantity Ratio: 3:2
- Spread Quantity: 200
- Price Ratio: 1.5001

## Initial Leg and Spread Prices:

<u>Contract</u>	<u>Price</u>	<u>Leg Quantity</u>
FVM2:	123-14.5	600
TYM2:	131-13	400
Spread Price:	0	

# Treasury Spread: Pricing Example

**Scenario:** Parallel five basis point shift (up) in the yield curve, i.e., yields on both 5-year notes and 10-year notes increase by 5 basis points.

- Prices of both securities increase, but the yield curve shape remains unchanged

## New Leg and Spread Prices:

<u>Contract</u>	<u>Price</u>	<u>Net Change (32nds)</u>
FVM2:	123-06	-8.5
TYM2:	131-00	-13
Spread Price:	$(-8.5) - (-13/1.5001)$	$= 0.16/32^{\text{nd}*}$

### \*NOTE:

This implied price (0.16) would be rounded to the nearest allowable tick, i.e. 0/32nd Bid or +.25/32nd Ask

# Treasury Spread Example

## How do I measure the profit/loss from this trade?

- If the trade takes place on the implied bid price (0/32<sup>nd</sup>):

The dollar change in the spread from the previous day's settlement price is equal to:

$$\frac{\text{Spread Price}}{0/32^{\text{nd}}} * \frac{\$ \text{ value of } 1/32^{\text{nd}}}{\$31.25} * \frac{\# \text{ Front Leg Contracts}}{600 \text{ FVM}} = \frac{\text{P/L}}{=} = \$0$$

- If the trade takes place on the implied offer price (.25/32<sup>nd</sup>)

The dollar change in the spread from the previous day's settlement price is equal to:

$$\frac{\text{Spread Price}}{.25/32^{\text{nd}}} * \frac{\$ \text{ Value of } 1/32^{\text{nd}}}{\$31.25} * \frac{\# \text{ Front Leg Contracts}}{600 \text{ FVM}} = \frac{\text{P/L}}{=} = \$4,687.50$$

# U.S. Treasury Futures ICS on CME Globex: Exception for 2-Year and 3-Year T-Note Contracts

The price ratio of spreads including 2-Year and 3-Year T-Notes is doubled to take into account that their notional size (\$200,000) is twice that of the other Treasury futures contracts.

**Example:** June TUT spread, 2-Year T-Notes (TU) vs. 10-Year T-Notes (TY)

External Name	TUT 02:01 M2
Leg Quantity Ratio	Two TUM2 / One TYM2
Price Quantity Ratio	4.0001

Spread Pricing:	<u>Contract</u>	<u>Net Change (32nds)</u>
	TUM2:	+6.5
	TYM2:	+16
	Spread Price: $(+6.5) - (+16/4.0001) = 2.5/32^{\text{nd}*}$	

# Spread Pricing Example

	Bid Price	Ask Price	C. Last	C. Net Change	Previous Day's Settlement Price
UBM2	157-16	157-17	157-17	+1-21	155-28
USM2	142-14	142-15	142-15	+15	142-00
TYM2	131-28	131-285	131-28	+7.0	131-21
FVM2	123-147	123-152	123-15	+4.75	123-102
TUM2	110-175	110-177	110-177	+1.75	110-16

Spread	Bid	Ask
BOB 05:03 M2	-18B	-16A
NOB 02:01 M2	-0.5 B	+1.0 A
FOB 03:01 M2	-0.5B	+0.5A
FYT 03:02 M2	-0.5B	+0.5A
TUB 04:01 M2	-0.5B	0.25A
TUT 02:01 M2	-0.5B	0.25A
TUF 01:01 M2	-1B	-0.25A

## NOB Price:

**Bid:  $7.0 - (15.0/2.0001) = -0.4996 \rightarrow -0.5$  Displayed Bid**

**Ask:  $7.5 - (14/2.0001) = 0.05003 \rightarrow +1$  Displayed Ask**

# U.S. Treasury Futures ICS on CME Globex: Summary

- Deferred month spreads will be listed midway through the month prior to a contract expiration month:
  - For example, September intercommodity spreads will be listed in mid-May, and will join the existing June spreads.
- All spreads are eligible to trade until expiration day of whichever leg expires first.
- Price and quantity ratios are expected to remain unchanged absent substantial changes in the marketplace
- Quantity ratios are calculated based on DV01 of respective cheapest-to-deliver (CTD) securities
- Price ratios equal the front leg quantity divided by the deferred leg quantity:
  - The last decimal place of price ratios may be rounded to maximize match engine efficiency
- Defined spread orders will take precedence over implied orders at a given price

# For more Information

Visit [www.cmegroup.com/ics](http://www.cmegroup.com/ics) for additional information, including:

- Current ratios
- Access to the *ICS Curve Tracker*
- ISV and Quote Vendor Symbols

If you have additional questions, contact the Interest Rate Products and Services team:

Pete Barker, Director	312-930-8554	<a href="mailto:peter.barker@cmegroup.com">peter.barker@cmegroup.com</a>
Mike Kamradt, Director	312-466-7473	<a href="mailto:mike.kamradt@cmegroup.com">mike.kamradt@cmegroup.com</a>
Jonathan Kronstein, Director	312-930-3472	<a href="mailto:jonathan.kronstein@cmegroup.com">jonathan.kronstein@cmegroup.com</a>
Dave Reif, Associate Director	312-648-3839	<a href="mailto:david.reif@cmegroup.com">david.reif@cmegroup.com</a>
Suzanne Spain, Associate Director	312-338-2651	<a href="mailto:suzanne.spain@cmegroup.com">suzanne.spain@cmegroup.com</a>

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.

The Globe Logo, CME®, Chicago Mercantile Exchange®, and Globex® are trademarks of Chicago Mercantile Exchange Inc. CBOT® and the Chicago Board of Trade® are trademarks of the Board of Trade of the City of Chicago. NYMEX, New York Mercantile Exchange, and ClearPort are trademarks of New York Mercantile Exchange, Inc. COMEX is a trademark of Commodity Exchange, Inc. CME Group is a trademark of CME Group Inc. All other trademarks are the property of their respective owners.

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. Although every attempt has been made to ensure the accuracy of the information within this presentation, 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.

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