Overview of Inter-Commodity Spreads for Interest Rate Products

CME Group

U.S. Treasury Futures Inter Commodity Spreads ("ICS") on Globex

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

Treasury ICS Examples Include:
TUF: 2-Yr T-Note vs. 5-Yr T-Note
FYT: 5-Yr T-Note vs. 10-Yr T-Note
NOB: 10-Yr T-Note vs. T-Bond
BOB: T-Bond vs. Ultra T-Bond

Treasury Future-Swap Future Examples Include:
5Y Treasury Fut vs. 5Y MAC Swap Future
10Y Treasury Fut vs. 10Y MAC Swap Future

Key Benefits

- ✓ **Eliminates price slippage,** providing easier, more efficient execution of Treasury and Swap spreads
- ✓ **Increases matching opportunities,** implied functionality provides automated arbitrage between outright and spread order books, enhancing liquidity and market efficiency
- ✓ **Provides arbitrage opportunities:** Match engine may be able to "leg" spread orders at prices better than the spread order price

ICS Mechanics and Pricing

U.S. Treasury Futures ICS on Globex

- **"Buying the spread" refers to buying the front leg and selling the second leg (a steepener)**
- **Spreads trade in exchange-defined ratios.**
  - Quantity ratios are calculated based on DV01 of respective cheapest-to–deliver securities
  - Price ratios equal the front leg quantity divided by the deferred leg quantity
    - The front leg is the contract with the shorter maturity
  - Price and quantity ratios are expected to remain unchanged absent substantial changes in the marketplace.
- **Minimum spread tick is equal to that of the minimum tick of the front leg of the spread.**
- **Components of the spread trade have the same expiration month and year:**

  June 2017 5-Yr U.S. Treasury Note vs. June 2017 10-Yr U.S. Treasury Note

  External name: FYT 03-02 M7

  Quantity Ratio: 3:2 Price Ratio = 1.5000

- **Pricing -** Treasury vs. MAC Swap spreads represent similar points on the yield curve, whereas Treasury spreads represent different points on the yield curve. As a result, they are priced differently.

ICS Between U.S. Treasury Futures

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

= Spread Price

ICS Between U.S. Treasury Future and MAC Swap Future

Treasury Futures leg price
- MAC Swap Futures leg

= Spread Price

Treasury Spreads: Exception for 2-Yr T-Note Contract

U.S. Treasury Futures ICS on Globex

The price ratio of spreads that include 2-Year T-Note is doubled to take into account that its 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 M7
Leg Quantity Ratio	Two TUM7 / One TYM7
Price Quantity Ratio	4.0000

Spread Pricing:

Contract	Net Change (32nds)
TUM7:	+6.5
TYM7:	+16

Spread Price: (+6.5) – (+16/4.0000) = 2.5/32nd

ICS Globex Specifications

U.S. Treasury Futures ICS on Globex

Listing and Trading

- Deferred month spreads will be listed midway through the month prior to a contract expiration month:
  - For example, September inter commodity 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.

Order Type Specifications

- Good Till Cancelled (GTC) and Good till Date (GTD) order qualifiers not supported.
- Spread type: IV

Matching

- Implied outrights created by Inter Commodity spreads have FIFO priority.
- Defined spread orders will take precedence over implied orders at a given price.

Market Data

- Generally only 1st 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

ICS Trade Matching Process

U.S. Treasury Futures ICS on Globex

If available, incoming ICS orders match with existing ICS orders at the required price. Otherwise, Globex will "leg" the spread order.

1. **The ICS matches with a resting ICS order 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 assigned price of the back leg matches the settlement price of the previous day (unchanged)
2. **If a match isn't available in the spread book, Globex will look to the constituent leg prices to see if there is a potential match.**
   - In cases where 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

Trade Match Example

The June FYT is currently listed at a 3:2 quantity ratio (and a corresponding 1.5000 price ratio)

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

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

- **FYT Bid price: (+1.25) – (+5.5/1.5000) = -2.4167B**
  - **Disseminated as: -2.50 (-2.416 rounded down to the nearest .25/32nd increment)**
- **FYT Ask price: (+1.50) – (+5.0/1.5000)= -1.8333A**
  - **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 -2.4167, while a buyer would pay -1.8333.

Treasury Spread: Pricing Example

U.S. Treasury Futures ICS on Globex

FYT 03-02 M7 (5-Year T-Note vs. 10-Year T-Note)

Quantity Ratio: 3:2 Spread Quantity: 200 Price Ratio: 1.5000

	Prior-Day Settle Price	Current Price	Net Change	Leg Quantity
FVM7	123-14.5	123-06	-8.5	600
TYM7	131-13	131-00	-13	400

Spread Price = (-8.5) – (-13/1.5000) = 0.1667/32nd

NOTE: This implied price (0.1667) would be rounded to the nearest allowable tick, i.e. 0/32nd Bid or +.25/32nd Ask

Ultra T-Bond Future (UB) vs. 30-Year MAC Swap Future (B1U)

	Current Price
UBM7	163-04
B1UM7	94-07

Spread Price = (163-04) – (94-07) = 68 and 29/32nd

Treasury Spread: Pricing Example

U.S. Treasury Futures ICS on Globex

	Prior-Day Settle Price	Current Price	Net Change	Leg Quantity
FVM7	123-14.5	123-06	-8.5	600
TYM7	131-13	131-00	-13	400

Spread Price = (-8.5) – (-13/1.5000) = 0.1667/32nd

NOTE: This implied price (0.1667) would be rounded to the nearest allowable tick, i.e. 0/32nd Bid or +.25/32nd Ask

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

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

	Spread Price	x	$ Value of 1/32nd	x	# front leg contracts	=	P&L
If the trade takes place on the bid price (0.00)	0/32nd	x	$31.25	x	600	=	$0.00
If the trade takes place on the ask price (0.25)	0.25/32nd	x	$31.25	x	600	=	$4,687.50

Spread Pricing Example

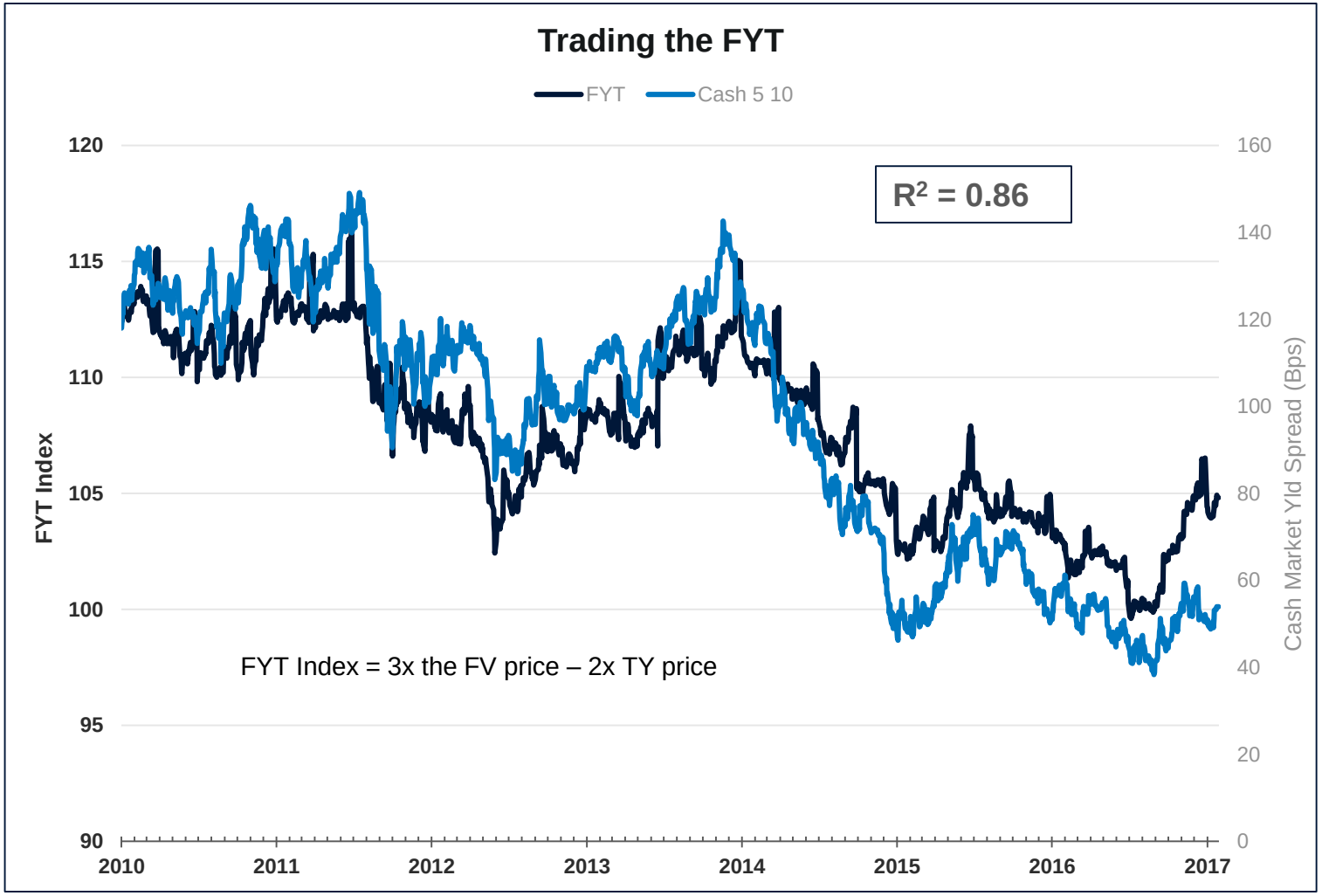
U.S. Treasury Futures ICS on Globex-Implied Markets

	Prior Day's Settlement Price	Bid Price	Ask Price		Bid Net Change	Ask Net Change
UBM7	165-28	167-16	167-17		+1-20	+1-21
USM7	152-00	152-14	152-15		+14	+15
TNM7	141-15	141-250	141-255		+10	+10.5
TYM7	131-21	131-28	131-285		+7.0	+7.5
FVM7	123-102	123-147	123-152		+4.5	+5.0
TUM7	110-16	110-175	110-177		+1.5	+1.75

Spread	Bid	Ask
BOB 04:03 M7	-26	-24
NOB 03:01 M7	+2.0	+3.0
FYT 03:02 M7	-0.5	+0.5
TUF 05:04 M7	-0.5	+0.0

NOB Price:
Bid: **7.0** – (**15**/3.0000) = 2.0000→ **+2.0** Displayed Bid
Ask: **7.5** – (**14**/3.0000) = 2.8333 → **+3.0** Displayed Ask

Trading the FYT – 5Y Note Future vs. 10Y Note Future



For More Information…

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